ESO-2189

Analysis of Agricultural Export Supply and Import Demand in Mainland China

Wen S. Chern
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First Year Final Report
Submitted
To
The Council of Agriculture
Executive Yuan
Taipei, Taiwan, ROC

December 1994

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Executive Summary

This report presents the results of data base development, trend analyses of Mainland China's agricultural exports and imports during 1980-1992, a period under economic reforms, and the econometric analysis of export supply and import demand for key agricultural commodities.

Data collection focuses on the variables related to export supply and import demand. Both annual time series and quarterly data were collected. During this first year of the project, only aggregate (national) data were analyzed even though the provincial and household-level data were also collected for Shandong, Jiangsu, and Fujian.

Since 1980, agricultural exports in Mainland China have increased very rapidly, especially rice, soybeans, vegetables, peanuts, tea, and aquatic products. The exports of live hogs and pork also registered strong grains, but with large fluctuations from year to year. The main imported agricultural commodities were wheat and sugar. In addition, Mainland China also imported large quantities of logs and fertilizers. In the case of Jiangsu province, the production of grains, cotton, peanuts and oil seeds has rapidly increased since the start of the economic reform in 1978. It's main exports are vegetables, cotton, and aquatic products. The export of pork has fluctuated greatly over the years. In 1992, its export of frozen pork dropped suddenly.

The econometric results of estimating export supply and import demand functions provide the following insights about Mainland China's agricultural trade.

Export Supply:

(1) The exports of grains (rice and soybeans) have been affected mostly by domestic output. The relative prices (i.e., between export price and domestic price) played a very minimal role in Mainland China's grain exports.

(2) The relative prices are the most important determinant for the export of pork. When the export price of pork increases, Mainland China will be able to increase its pork export in the future.

(3) There was a significant seasonal pattern of pork exports from Mainland China. Specifically, the pork export was the highest during the third quarter (July-September) and the lowest in the first quarter (January-March).

(4) Domestic output is shown to have a positive impact while the relative prices and household income have negative impacts on the exports of fruits.

(5) For vegetables and aquatic products, their exports were affected by domestic production, not the relative prices.

(6) Household income was found to be a significant factor affecting the exports of pork, fruits and aquatic products. Therefore, increases in household income will reduce the exports of these products in the future.

Import Demand:

(1) The main factors affecting the imports of grains (mainly wheat) include the relative prices (import price over the domestic purchase price), domestic output, and the gross domestic product (GDP). Thus, the import demand behavior appears to be consistent with the economic rationalization based on the supply and demand conditions.

(2) The sugar import is found to be negatively related to the domestic production and relative prices but positively related to GDP.

The econometric results imply that the potential for Mainland China to sustain and/or to expand its agricultural exports critically depends upon its ability to reduce the production costs (and thus the domestic prices) and its ability to expand the domestic production of its key export products such as rice, pork, and aquatic products. With increasing costs of labor and land, and the keen competition of agricultural land for urban and industrial uses in the coastal region, the potential to increase agricultural production can not be very optimistic. Further research on supply response and the elasticity of substitution among crops and livestock will be needed to assess the future potential of agricultural exports in Mainland China.

Contents

Introduction

The objective of this project is to analyze and assess the future prospects of agricultural trade between Taiwan and Mainland China under the General Agreement on Tariffs and Trade (GATT). The Uruguay Round under the GATT was successfully concluded on December 15, 1993. These agreements remain to be rectified by members of the GATT. Both Taiwan and Mainland China have applied for membership in the GATT. The granting of these memberships is a matter of time. Although the effects of the GATT on the agricultural trade between Taiwan and Mainland China will not be immediate but gradual, the long term effects could be dramatic and substantial. It is, therefore, important to understand these potential impacts.

Agricultural trade is most affected by the comparative advantages of producing various agricultural commodities among countries. These comparative advantages are determined by a country's endowments of the factors of production such as land, labor, capital, and technology. Both Taiwan and Mainland China have very limited land resources (relative to their population). In 1991, per capita arable land in Mainland China was only 1.238 mu. Using only the agricultural and fishery labor force, per capita arable land (per farm labor) was 4.197 mu.[1] However, Mainland China has a large surplus of agricultural labor force, making its labor costs for agricultural production much lower than that in Taiwan. It is, therefore, only natural to believe that

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[1]In 1991, total arable (cultivated) land was 1.434.8 million mu, total population was 1.158.2 million and total labor force in agriculture and fishery was 341.86 million.

Mainland China has comparative advantages in agriculture over Taiwan. While this may be true in general terms, it certainly can not be uniformly the case for all commodities. In fact, agriculture has historically faced many uncertainties. Agricultural production is constrained by natural climatic and soil conditions. Farming technology may be easily transferred but farming skills are matters of culture and customs. Since 1978, Mainland China has gradually adopted a mixed planned and market economy. While agricultural productivity increased dramatically during early 1980s, it has stagnated in recent years due to many technological and policy factors. In particular, there has been inconsistency in agricultural policies between the central and local government. The central government's agriculture policy is centered on productivity, self sufficiency, stability, and development of rural enterprises. It does not have expansion in its agricultural exports as one major objective. On the other hand, the provincial and local governments are highly profit oriented. Expanding agricultural export markets has been one important goal for provincial governments, particularly in coastal areas such as Jiangsu and Fujian. However, in these costal provinces, rapid industrialization has made agricultural production highly uncompetitive with manufacturing and services. The costs of land and labor for agriculture production have increased dramatically in recent years. Thus, the future ability to increase their agricultural exports in this rapidly growing coastal region is uncertain.

During the last 15 years under economic reforms, Mainland China has witnessed growing household income and rapid increases in its demand for foods, especially livestock products. The increasing demand for food would also affect negatively

Mainland China's ability to export agricultural goods. In fact, many economists have predicted Mainland China will be a net importer of grains (for food and feed).

During the first year of this project, we have made considerable efforts in developing various data bases. This report documents the research activities undertaken and research findings obtained during the first year. The remainder of this report covers (1) literature review, (2) data sources, (3) descriptive trend analysis, and (4) econometric estimation of export supply and import demand for key agricultural commodities in Mainland China.

Literature Review

For the purpose of assessing the state-of-the-art in economics literature related to Mainland China's agricultural trade, we reviewed two major publications. One is the book entitled, Chinese Grain Economy and Policy by Chen and Buckwell (1991). The other is a report entitled, The Study of Mainland China's Imports and Exports of Agricultural Products by Chou, Tuan and Lu (1990). The former is selected because it contains econometric estimates of the supply response of several key grain products while the later is chosen because it addresses specifically the trade relationships between Taiwan and Mainland China. These two studies were carefully reviewed and their major conclusions are presented in detail in Appendix A. In this section, only the key relevant findings of these two studies are briefly summarized.

Since grains provide the most important staple food in Mainland China, the previous studies of Chinese agriculture mostly focused on grains. The book by Chen and Buckwell represents one of such studies. One distinctive feature of this book is that it provides quantitative estimates of several key supply elasticities of grains in China. Even though the study also covers estimation of grain consumption and grain export/import (as reviewed in Appendix A), these models are not as well specified as done elsewhere.[2] We present here only their estimates of the supply responses of grains.

Chen and Buckwell estimated the following supply response function for aggregate and individual grains:

$$y = f(P, P1, P2, A, T, W, D) \qquad (1)$$

where y = output of grains (total or individual crops),

p = purchasing price of grain(s),

p_1 = price ratio (grain(s) over cotton),

p_2 = price ratio (grain(s) over fertilizers),

A = sown area of grains, (total or individual crops),

T = time trend,

W = area suffered from natural calamities,

D = dummy variables to reflect different policy eras (D1 = 1 for 1959-61, D2 = for 1962-65, D3 = 1 for 1966-77, and D4 = for 1978-84).

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[2]For example, a complete food demand system for Chinese urban households was estimated by Chern and Wang (1994).

For estimating the supply response of soybeans, the variable P1 is replaced by the following set of price ratio variables:

Pa = price ratio (soybeans over cotton),

Pb = price ratio (soybeans over wheat),

Pc = price ratio (soybeans over corn).

Various supply functions were estimated by ordinary least squares (OLS) using the annual data for 1953-1985. One key supply elasticity is the price elasticity. Table 1 summarizes their estimates obtained from models excluding the dummy variables (D). The results show there are considerable variations on the estimated price elasticities of grain supply, depending upon model specification. From these estimated results, one can conclude that (1) the supply of grains in Mainland China is inelastic with respect to price, (2) wheat is more price elastic than rice, and soybean is the least responsive to changes in price. Despite the relative low price elasticities of grain supply, they are not statistically insignificant. Therefore, any changes in relative prices would affect the supplies of various grains. For example, if the price of rice increases, the supply of rice will increase even though by a relatively smaller percentage. The sensitivity of these estimates shows the uncertainty about the true price response of grains in Mainland China. For this project, we will further examine these estimates by using more recent household survey data in the selected coastal provinces. Furthermore, we will estimate the supply response functions of other agricultural products such as meats, fruits and vegetables which will likely to be the key commodities traded between Taiwan and Mainland China.

The study by Chou, Tuan, and Lu (1990) is mostly descriptive. They attempted to analyze and compare the recent trends (1983-1988) of the agricultural trade performance between Mainland China and Taiwan. Since Mainland China and Taiwan also compete with each other in the markets of Japan, Hong Kong, and the U.S., extensive comparisons were conducted for these markets. The authors pointed out the similarities and differences in agricultural trade patterns between Mainland China and Taiwan. For example, both China and Taiwan exported, in considerable quantity, fruits and vegetables (Category 05) and aquatic products (Category 03) and imported a considerable amount of cereal products (04) and softwood and timber (24). Nevertheless, Mainland China has had net agricultural trade surplus while Taiwan has been in deficit. With respect to the Japanese market, Mainland China dominated its exports of fruits and vegetables (05) while Taiwan has been leading China in aquatic products and meat products (mostly pork). The authors also pointed out Taiwan appeared to lose ground in the Hong Kong market, as witnessed by the significant drop of its exports of fruits and vegetables.

The study by Chou et al. provided much useful descriptive analysis about the agricultural trade patterns and performance between Mainland China and Taiwan. These historical trends are, by no means, easy to generalize. In fact, these trends reflect complex relationships among domestic production, demand, and relative prices in the domestic and the world market. It would be essential to understand the factors effecting Mainland China's exports and imports of agricultural goods. Under this project, we

have estimated Mainland China's export supply and import demand of its key agricultural commodities, as reported later.

Table 1. Estimated Price Elasticities of Grains in Mainland China[a]

Model	Product	Estimated Price Elasticity	Comments
National Aggregate	All Grains	0.57 0.35 0.47	Complete Model Without P2 Without A
	Rice	0.85 0.32 1.11	Complete Model Without P2 Without P2 and T
	Wheat	1.41 1.30 0.59	Complete Model Without A Without P2
	Soybeans	0.39 0.34 0.36	Without Pb Without Pb and Pc Without Pc
Regional			
Pindu County in Shandong	All Grains	0.84 0.44	Complete Model Without P2
Jianou County in Fujian	All Grains	0.48 0.48	Complete Model Without P2

[a]All models selected here excluded the dummy variables (D).
Source: Chen and Buckwell (1991).

Data Bases

For this project, we collected two major types of data for econometric analysis. The first data base is national aggregate while the second is provincial level data for the three provinces of Jiangsu, Fujian, and Shandong. Since these data bases are used for

econometric estimation, the data series need to be consistent across the same time period. Also, our study focuses on the reform period after 1978. Therefore, the data collected are mostly confined to the time period of 1978 to 1993. For selected variables, particularly, the production related ones, we also collected data prior to 1978.

For aggregate data, the major sources are various issues of China Statistical Yearbook, published by the State Statistical Bureau (SSB). Since our main effort during the first year of this project is to estimate export supply and import demand, we have concentrated on collecting data related to export and import. In addition, we also collected data in production and prices (both procurement and retail) because they are needed in estimating the export supply and import demand functions. We noted that data on exports and imports of detailed agricultural products are not available until 1980. Thus, the annual time-series data have relatively few observations (13 years). It may not provide sufficient degrees of freedom for reliable estimation. Therefore, we also compiled quarterly data for developing the quarterly econometric models. Unfortunately, the quarterly data are available only for the quantities and values of exports and imports. The domestic production and commodity prices are available only on an annual basis. Therefore, when we estimate quarterly models (to be discussed later), we have to use annual data for several explanatory variables. The methods of creating quarterly data from annual data are described in the next section. The quarterly data in agricultural exports and imports were obtained from Colby, Crook and Webb (1992). The current data base covers only data up to 1990. The China section of the Economic Research Service of USDA has updated these quarterly data

series to 1992. These quarterly data on imports and exports were based on custom reports. These annual and quarterly data and selected graphs are presented in Appendices B and C.

We have also been collecting data for three provinces: Jiangsu, Fujian, and Shandong. These tasks have not been completed. The provincial data series were obtained from various issues of the statistical year books in these provinces. In addition, we also collected the annual reports of the Rural Household Surveys conducted by the SSB for Jiangsu and Fujian. Through the cooperation of Professor Eric Wailes of the University of Arkansas, we obtained the household level data from the Rural Household Surveys for four provinces (Jiangsu, Fujian, Shandong, and Guangdong). This household data set contains 200 variables with 1,190 observations. We have begun a descriptive analysis of these households. However, this task is not reported here. We will attempt to acquire more household-level data for this project. To achieve this aim, we are discussing with the SSB about further cooperation.

Methods of Deriving Quarterly Figures From Annual Data

The importance of consistent data series in building and estimating econometric models can never be underscored. Considerable efforts have been devoted to establishing the database for this study. Since the major focus of this study is on the economic and trade development of Mainland China during the periods of its economic reform, only about 13 yearly observations for major commodities are available. This

limited number of observations provides no guarantee for sound estimation of any econometric model. Thus tremendous efforts and time were spent on building the quarterly data base for estimating China's export supply and import demand of the key agricultural goods.

Among the variables involved, only three variables, i.e., volumes of export and import, values of export and import, and import of fertilizer have quarterly data. For all other variables such as per capita output of agricultural products, per capita GNP, per capita real urban income index, domestic retail prices, and the procurement prices of agricultural goods, only annual data are available. For these variables, we need to construct a quarterly data series from annual data.

Lisman and Sandee (1964) are among the first to develop a method of deriving quarterly data based on the annual totals. A further improvement was made by Boot, Feibes and Lisman (1967). Ginsburgh (1971) contributed to additional development of this method. The basic procedures in each of the above methods are outlined below.

Method of Lisman and Santee

Lisman and Santee suggested that the quarterly figures can be calculated to be a weighted sum of the yearly totals of three successive years, namely,

$$\begin{bmatrix} y_t^1 \\ y_t^2 \\ y_t^3 \\ y_t^4 \end{bmatrix} = \begin{bmatrix} a & e & d \\ b & f & c \\ c & f & b \\ d & e & a \end{bmatrix} \begin{bmatrix} x_{t-1} \\ x_t \\ x_{t+1} \end{bmatrix} \quad or \quad Y = TX$$

where y_t's are quarterly figures and x_t's are annual totals. The matrix T can be termed as the transformation matrix. Clearly, the coefficients matrix need to be derived in order to calculate the quarterly figures. The following four criteria have been used to derive the coefficients matrix (see also Boot, Feibes and Lisman(1967)):

i) Summation consideration:

The sum of the quarterly figures has to be equal to the given yearly totals. Namely

$$\sum_{i=4k-3}^{4k} y_i = x_k \quad (k=1,2,...,n)$$

ii) Symmetry consideration:

The quarterly figures derived from the successive annual totals of x_1, x_2, x_3 should be the same as from the totals of x_3, x_2, x_1 but in reverse order.

iii)Trend consideration:

The quarterly figures should move in the same direction as annual data do but at a pace of 1/4 of the latter.

iv) Cycle consideration:

Quarterly data should exhibit a cyclical movement in the similar pattern as the annual data.

Based on the above criteria, the following result was obtained:

$$\begin{bmatrix} y_t^1 \\ y_t^2 \\ y_t^3 \\ y_t^4 \end{bmatrix} = \begin{bmatrix} 0.291 & 0.793 & -0.084 \\ -0.041 & 1.207 & -0.166 \\ -0.166 & 1.207 & -0.041 \\ -0.084 & 0.793 & 0.291 \end{bmatrix} \begin{bmatrix} x_{t-1} \\ x_t \\ x_{t+1} \end{bmatrix}$$

Clearly, the quarterly figures for the first and last year of the series can not be derived, leading to a lose of 8 degrees of freedom for estimation. The transformation matrix can be applied to any data series.

Methods of Boot, Feibes and Lisman

The method of Lisman and Santee as described previously suffers a loss of 8 observations. Two methods were proposed by Boot, Feibes and Lisman to avoid this problem. One is to minimize the sum of squares of the differences between the successive quarterly value, the other is to minimize the sum of squares of the second differences.

subject to the constraints that the sum of quarterly figures should be equal to annual totals. These minimization problems can be expressed as:

$$\textit{Minimize:} \quad \sum_{i=2}^{4n} (y_i - y_{i-1})^2,$$

Or

$$\textit{Minimize:} \quad \sum_{i=2}^{4n} (\Delta y_i - \Delta y_{i-1})^2$$

Subject to:

$$\sum_{i=4k-3}^{4k} y_i = x_k \quad (k=1,2,\ldots,n),$$

The solution to this problem is :

$$\begin{bmatrix} B & -J' \\ J & 0 \end{bmatrix} \begin{bmatrix} y \\ l \end{bmatrix} = \begin{bmatrix} 0 \\ x \end{bmatrix}$$

Or

$$\begin{bmatrix} C & -J' \\ J & 0 \end{bmatrix} \begin{bmatrix} y \\ l \end{bmatrix} = \begin{bmatrix} 0 \\ x \end{bmatrix}$$

where B and C are all a band matrix of 4n×4n, J is a matrix of n×4n. They are expressed as the following:

$$B = \begin{bmatrix} 2 & -2 & 0 & 0 & 0 & \_ & 0 & 0 & 0 \\ -2 & 4 & -2 & 0 & 0 & \_ & 0 & 0 & 0 \\ 0 & -2 & 4 & 2 & 0 & \_ & 0 & 0 & 0 \\ . & . & . & . & . & . & . & . & . \\ 0 & 0 & 0 & 0 & 0 & \_ & -2 & 4 & -2 \\ 0 & 0 & 0 & 0 & 0 & \_ & 0 & -2 & 2 \end{bmatrix}$$

$$C = \begin{bmatrix} 2 & -4 & 2 & 0 & 0 & 0 & \_ & 0 & 0 & 0 \\ -4 & 10 & -8 & 2 & 0 & 0 & \_ & 0 & 0 & 0 \\ 2 & -8 & 12 & -8 & 2 & 0 & \_ & 0 & 0 & 0 \\ 0 & 2 & -8 & 12 & -8 & 2 & \_ & 0 & 0 & 0 \\ . & . & . & . & . & . & . & . & . & . \\ 0 & 0 & 0 & 0 & \_ & 2 & -8 & 12 & -8 & 2 \\ 0 & 0 & 0 & 0 & \_ & 0 & 2 & -8 & 10 & -4 \\ 0 & 0 & 0 & 0 & \_ & 0 & 0 & -2 & 4 & -2 \end{bmatrix}$$

$$J = \begin{bmatrix} 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 & \_ & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & \_ & 0 & 0 & 0 & 0 \\ . & . & . & . & . & . & . & . & . & . & . & . & . \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \_ & 1 & 1 & 1 & 1 \end{bmatrix}$$

Both methods generate reasonable results but the one which was based on minimizing squared second differences are believed to be better with respect to trend adaptation. The matrices, B, C, and J, can be applied to any data series.

Ginsburgh Method

All the above methods are pure mathematical methods which take no consideration on the quarterly information. Ginsburgh tried to overcome this disadvantage by combining the related series into the interpolated quarterly figures. This method works in following steps.

i) First is to obtain both annual (z*) and quarterly series (z^) of a related variable. The following regression equation between the variable in question and the related one using annual data is estimated:

$x^* = a_0 + a_1 z^*$.

ii) Next is to interpolate both x and z by using the methods of Boot, Feibes and Lisman to get the quarterly series x** and z**.

iii) Finally, the final quarterly figures of x are computed as follows:

$x^\wedge = x^{**} + a_1(z^\wedge - z^{**})$.

This method requires that both annual and quarterly data of the related variable be available.

For the purpose of this study, the method of minimizing squared second difference by Boot, Feibes and Lisman was used.

Agricultural Exports and Imports During the Reform Period in Mainland China

Since Mainland China began its economic reforms, the volumes of agricultural trade have rapidly increased. Table 2 shows that the total exports of agricultural and food related commodities increased from 3.12 billion U.S. dollars in 1980 to 9.21 billion in 1992, representing an average annual growth rate of 9.43 % during this period[3]. On the other hand, the imports of agricultural and food related goods increased only marginally during this period. In this section, we analyze the recent trends of exports and imports of selected key agricultural products. More detailed historical data and graphs are available in Appendices B and C.

Table 2. Agricultural Exports and Imports in Mainland China (Million U.S. Dollars)

Item	Exports		Imports	
	1980	1992	1980	1992
Food and Food Products	2,985	8,354	2,927	3,146
Beverages and Tobacco	78	721	36	239
Animal Fats and Vegetable Oils[a]	60	139	239	525
Total	3,123	9,214	3,202	3,910

[a]Include those for food and non food uses.
Source: State Statistical Bureau. Statistical Yearbook of China 1993. Beijing, China, 1993. pp.634-635.

[3]These data were collected by the Chinese Customs Bureau.

Agricultural Exports

Figure 1 shows the historical trends of the exports values of six major agricultural products in Mainland China during 1980-92. By 1992, grains and aquatic products had the two largest value shares of agricultural exports, followed by vegetables, tea, live hogs and pork. The total exports increased rapidly from 1983 to 1986, declined in 1987, and then steadily increased ever since. Figure 2 shows the exports of major crops. With respect to grains, the major export items are cereals (rice and corn), and soybeans.

Aquatic products show the most dramatic increases in exports during this period of 1980-1992 (Figure 3). In 1980 the total quantity of exports of aquatic products was 112 thousand tons and the figure was 440 thousand tons in 1992, representing an annual growth rate of 12% during this period. The corresponding exported values of aquatic products were 365 million and 1,370 million U.S. dollars, in 1980 and 1992, respectively. Similarly, the exports of vegetables have been rapidly increasing (Figure 4).

It may be reasonable to expect that the increased exports must be highly correlated with the increased production. While this is true for grains, it is not the case for hogs. Figure 5 shows that the hog production has been increasing, especially during 1987-1992. However, the exports of live hogs has been declining (Figure 6). The export of pork has been fluctuated during this period (Figure 7). These patterns of the exports of live hogs and pork perhaps reflect a strong competition in foreign markets such as Japan.

With respect to grains (mostly, corn, rice and soybeans), the exports have been fluctuating during this period (Figure 8). In 1992, Mainland China exported the largest quantity of grains (13.64 million tons). Peanut is another important commodity with a great potential for export to Taiwan. The export of peanut has been increasing steadily since 1982 with one exception in 1992 when the export dropped to about 300 thousand tons (Figure 9).

The production of fruits in Mainland China has increased rapidly during 1980-1992 (Figure 10). However, the export of fruits has steadily declined since 1988 (Figure 11). One possible explanation is the increased domestic demand for fruits. This pattern of export represents great uncertainty to assess the potential competition of fruit export to Taiwan. One important question is what factors determine the export of fruits?

Agricultural Imports

Figure 12 shows the historical trends of major agricultural imports, including log, wood, and fertilizer during 1983-1993. These are quarterly data and the three-quarter moving averages are presented in the figure. The major agricultural products imported are food grains and sugar (cotton is not included here). As one can see from these historical trends, the imports of food grains decreased during 1983-1985 and then increased until 1989 when it decreased again. Most of the imported grains was wheat as shown in Figure 13. The decreases in the imports of grain during 1983-1988 corresponds to the period with phenomenal agricultural production expansion and rapid

growth in productivity under the household responsibility system. Mainland China's grain production peaked in 1985. The decline in grain production in combination with the rapid increases in demand would explain the increases during 1988-1990. Further declines in grain import occurred in 1992-1993 when the import value reached to only U.S. $177 million in the fourth quarter of 1993, the lowest figure since the fourth quarter of 1986.

Mainland China imported a substantial amount of sugar. Figure 14 shows that sugar import peaked in 1988 and has then been declining ever since.

Figure 1

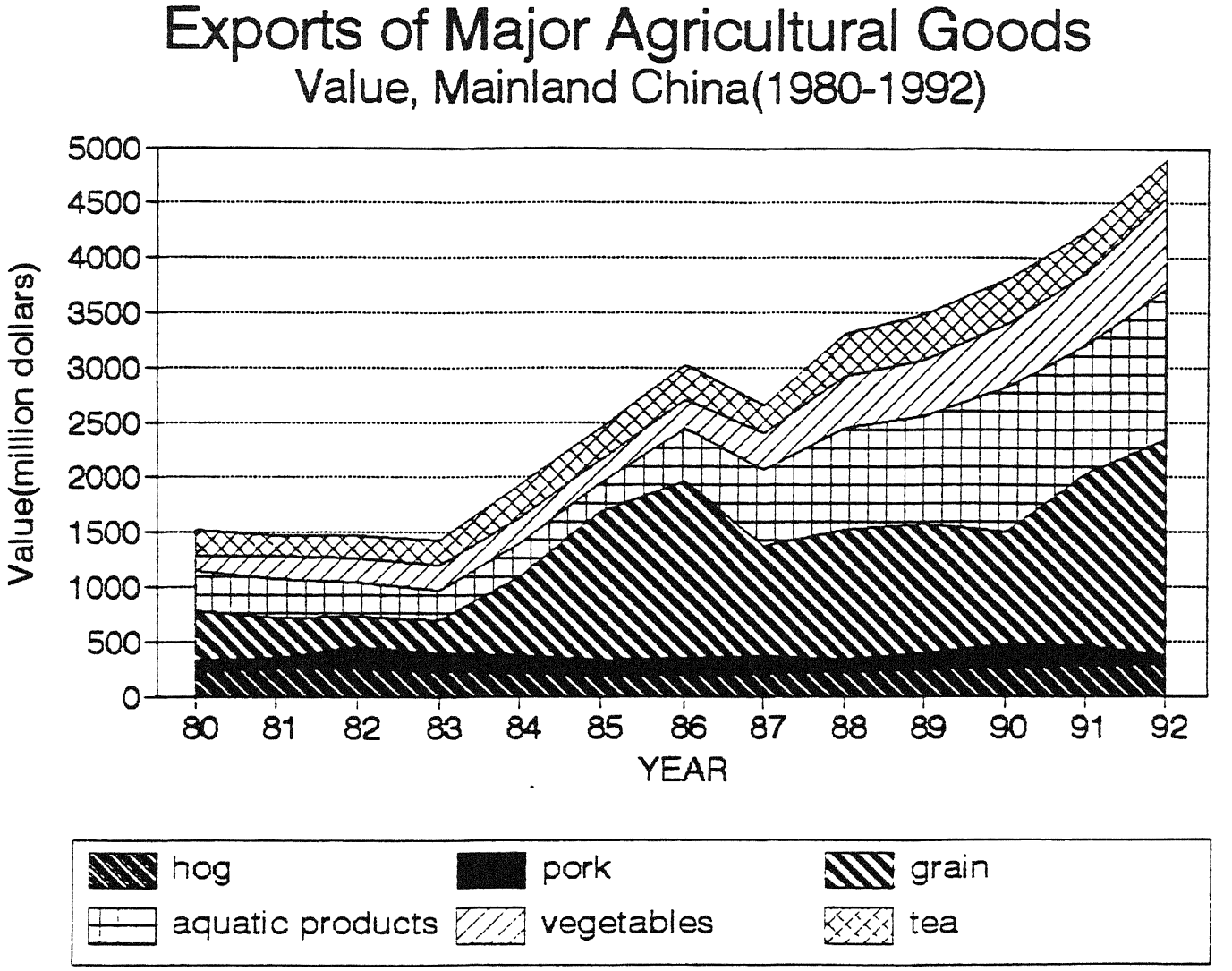

Exports of Major Agricultural Goods
Value, Mainland China(1980-1992)
Value(million dollars)
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
80
81
82
83
84
85
86
87
88
89
90
91
92
YEAR
hog
pork
grain
aquatic products
vegetables
tea

Figure 2

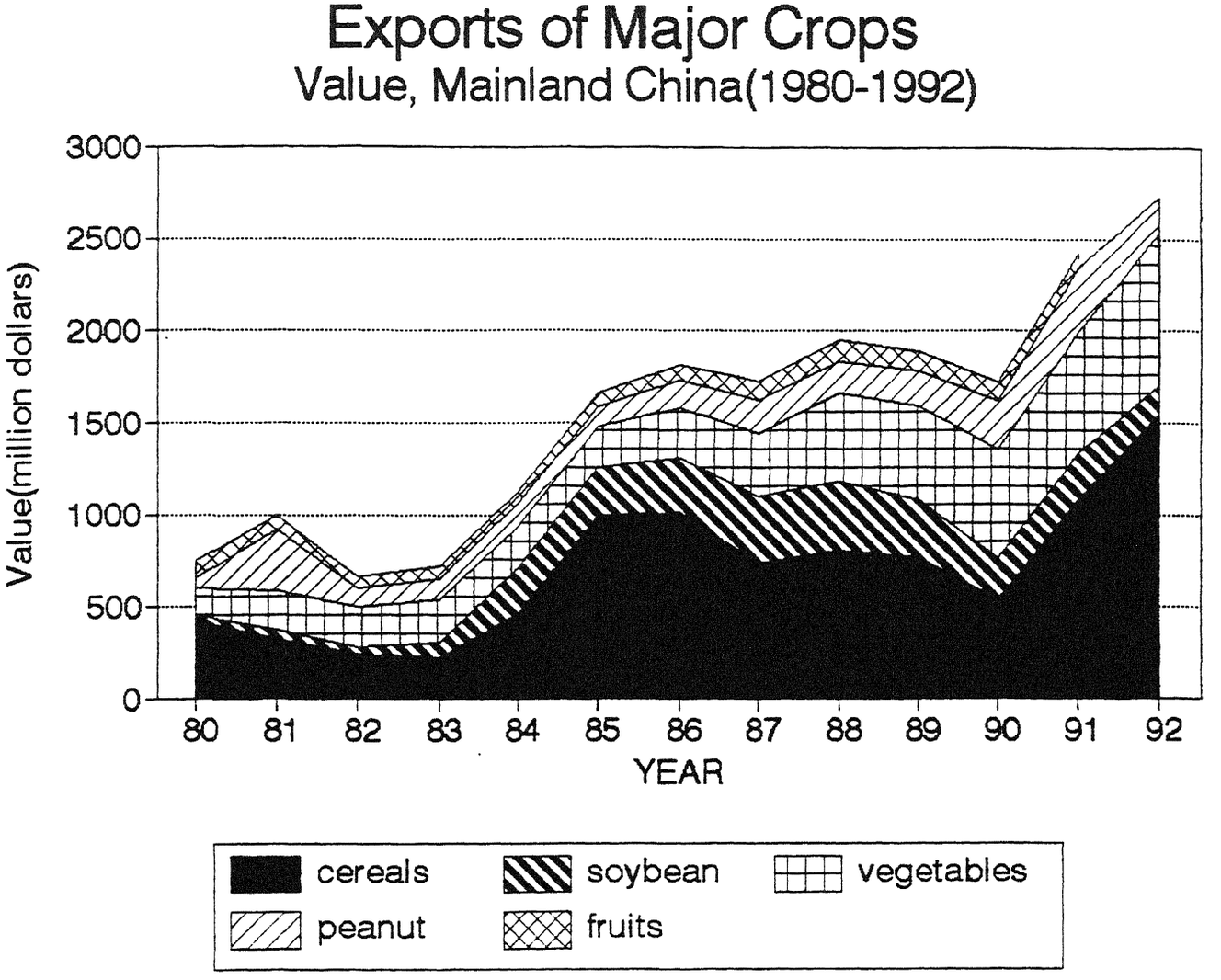

Exports of Major Crops
Value, Mainland China(1980-1992)
Value(million dollars)
3000
2500
2000
1500
1000
500
0
80
81
82
83
84
85
86
87
88
89
90
91
92
YEAR
cereals
soybean
vegetables
peanut
fruits

Figure 3

Export of Aquatic Products
Quantity, Mainland China(1980-1992)

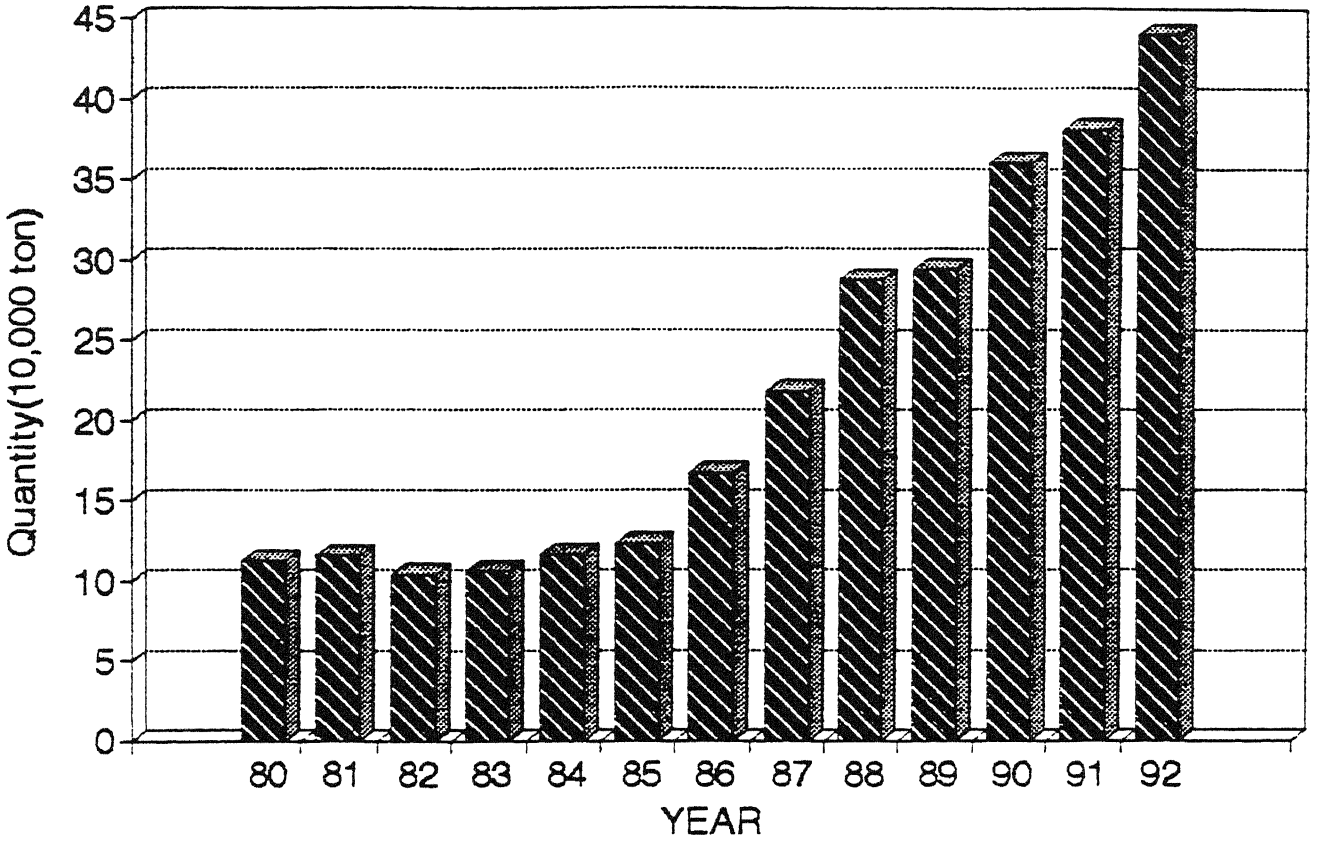


Figure 4

Export of Vegetable, Quantity
Mainland China(1980-1992)

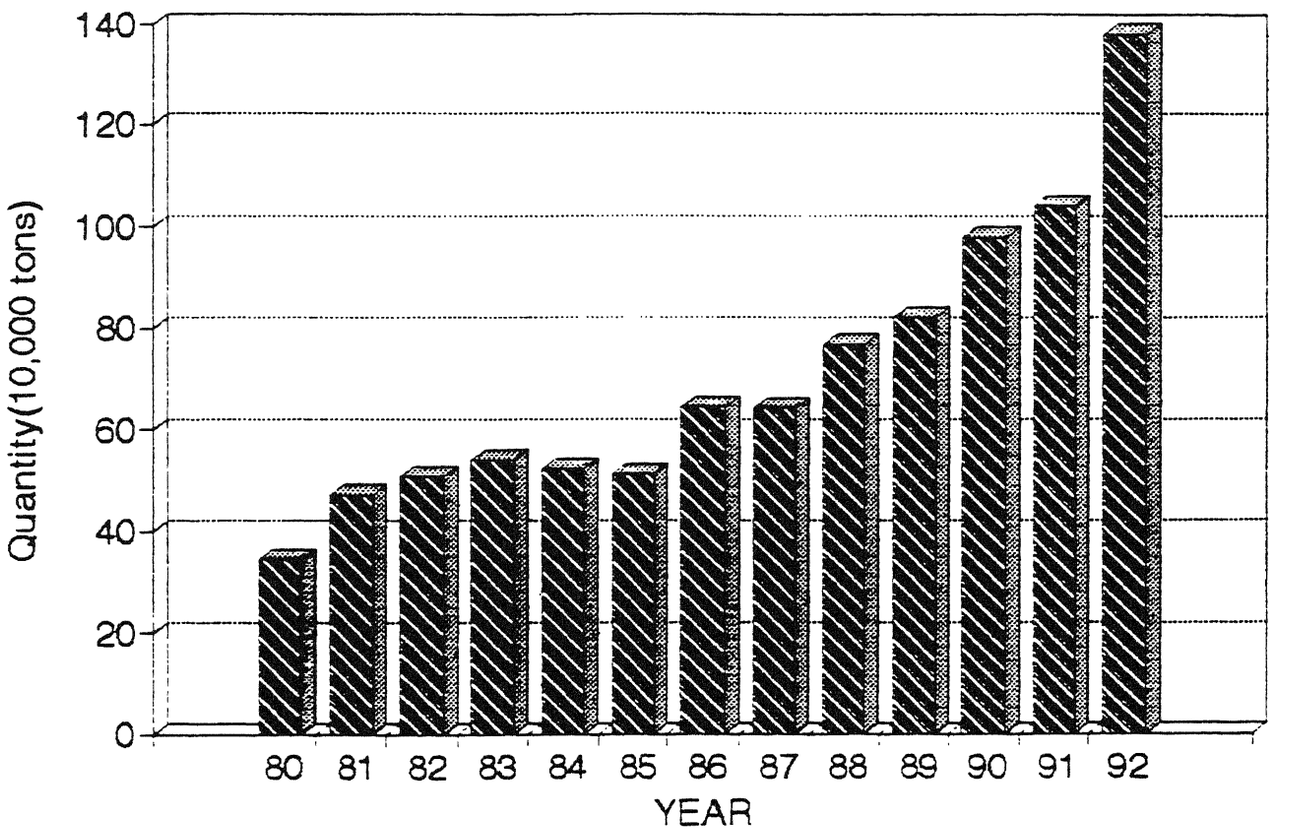


Figure 5

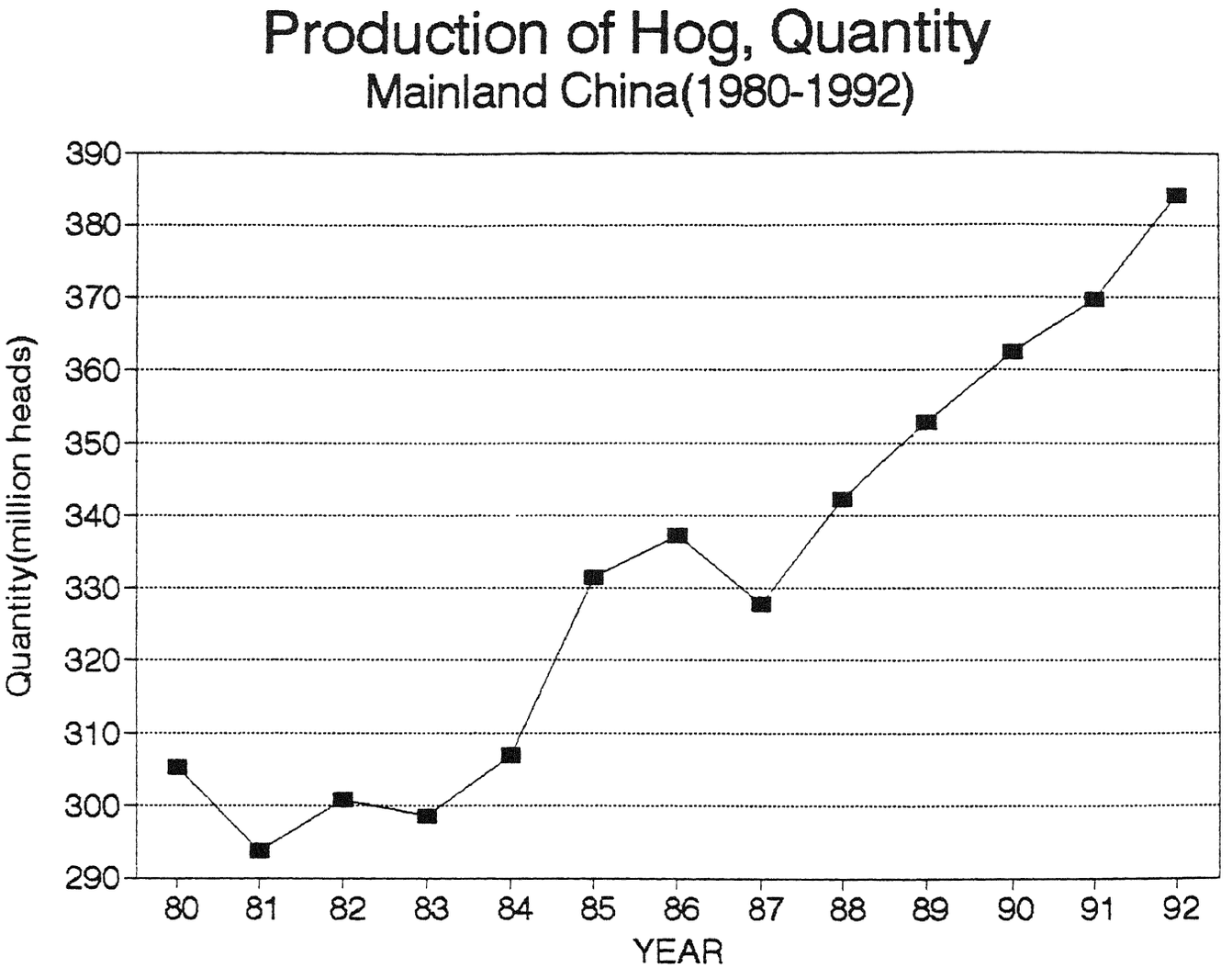

Production of Hog, Quantity
Mainland China(1980-1992)
Quantity(million heads)
390
380
370
360
350
340
330
320
310
300
290
80
81
82
83
84
85
86
87
88
89
90
91
92
YEAR

Figure 6

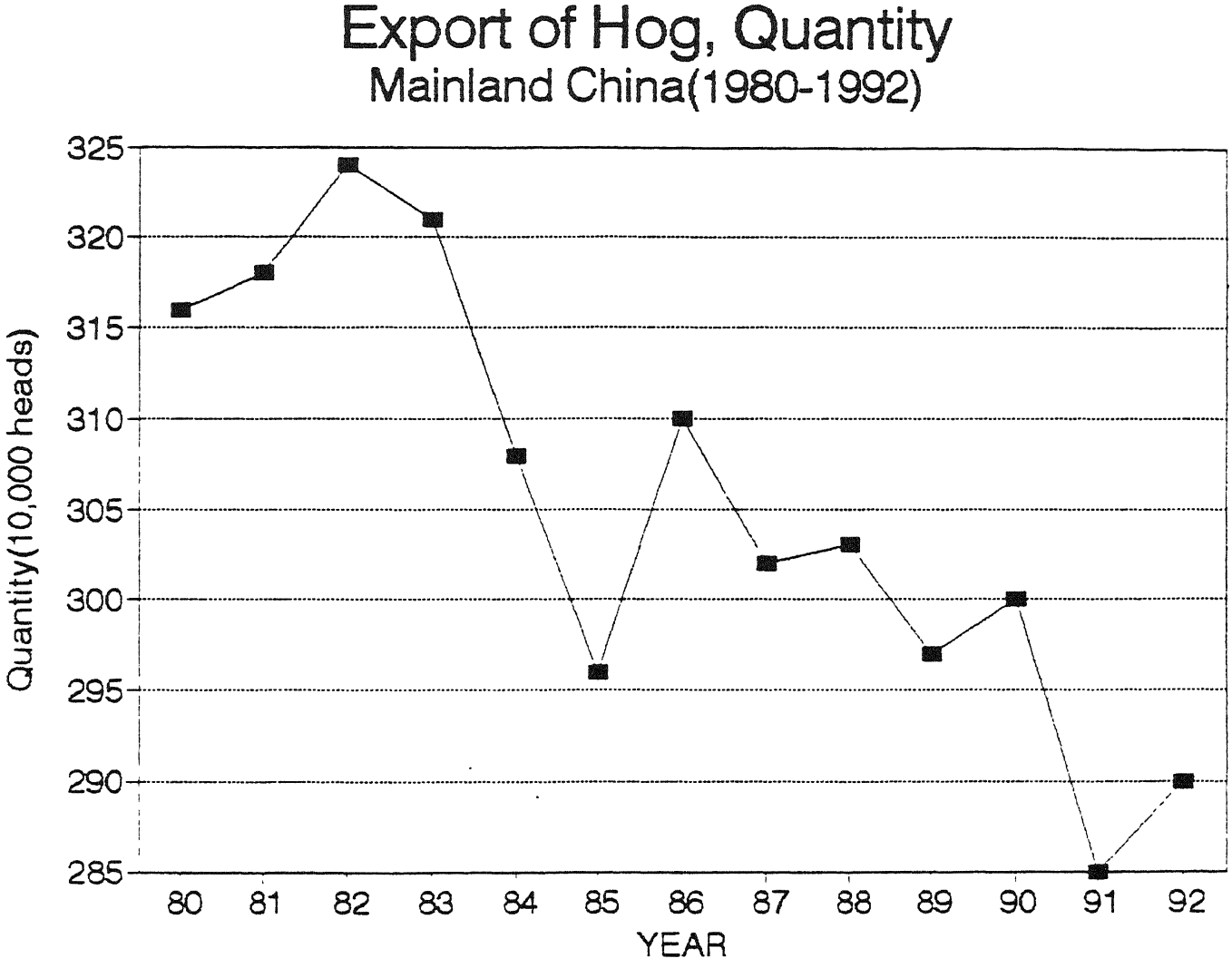

Export of Hog, Quantity
Mainland China(1980-1992)
Quantity(10,000 heads)
325
320
315
310
305
300
295
290
285
80
81
82
83
84
85
86
87
88
89
90
91
92
YEAR

Figure 7

Export of Pork, Quantity
Mainland China(1980-1992)

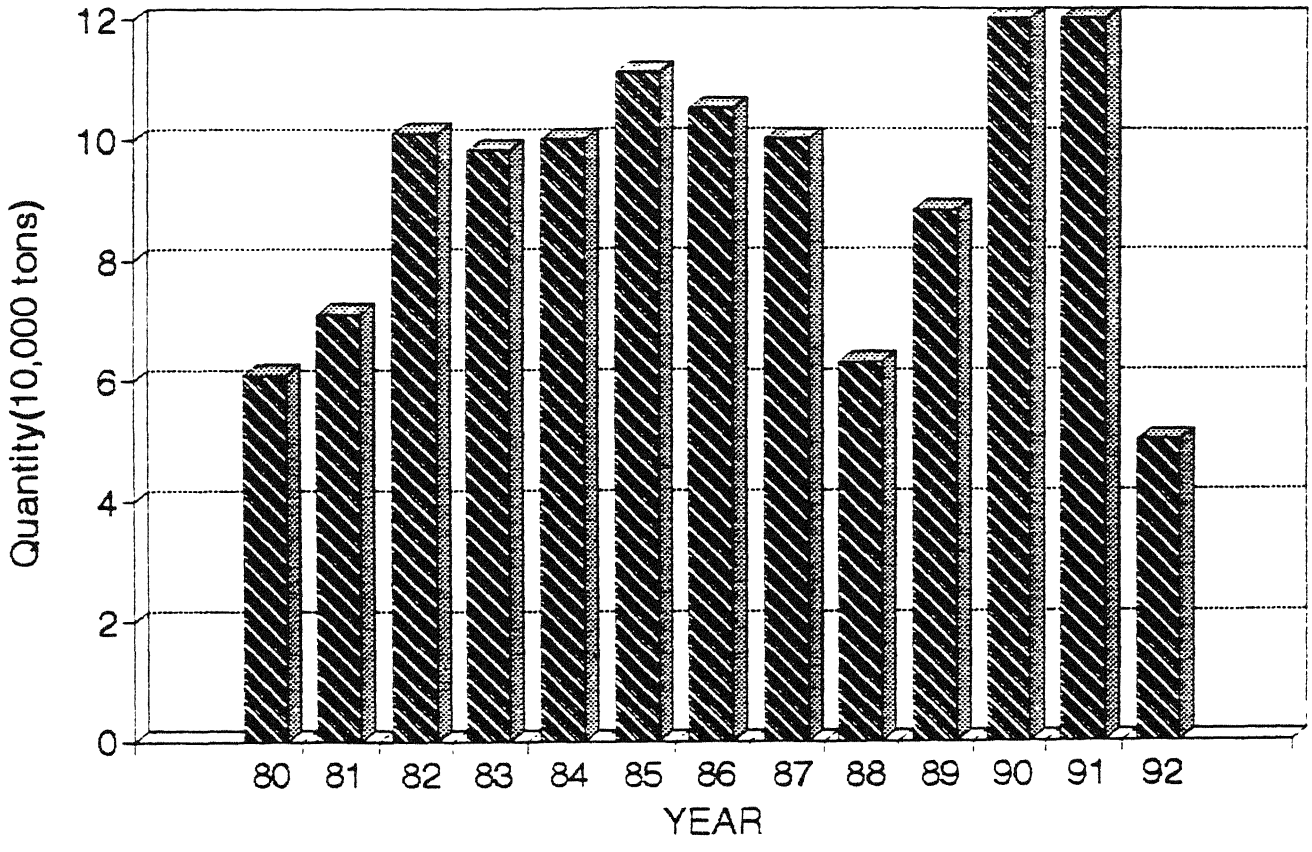


Figure 8

Export of Grain, Quantity
Mainland China(1980-1992)

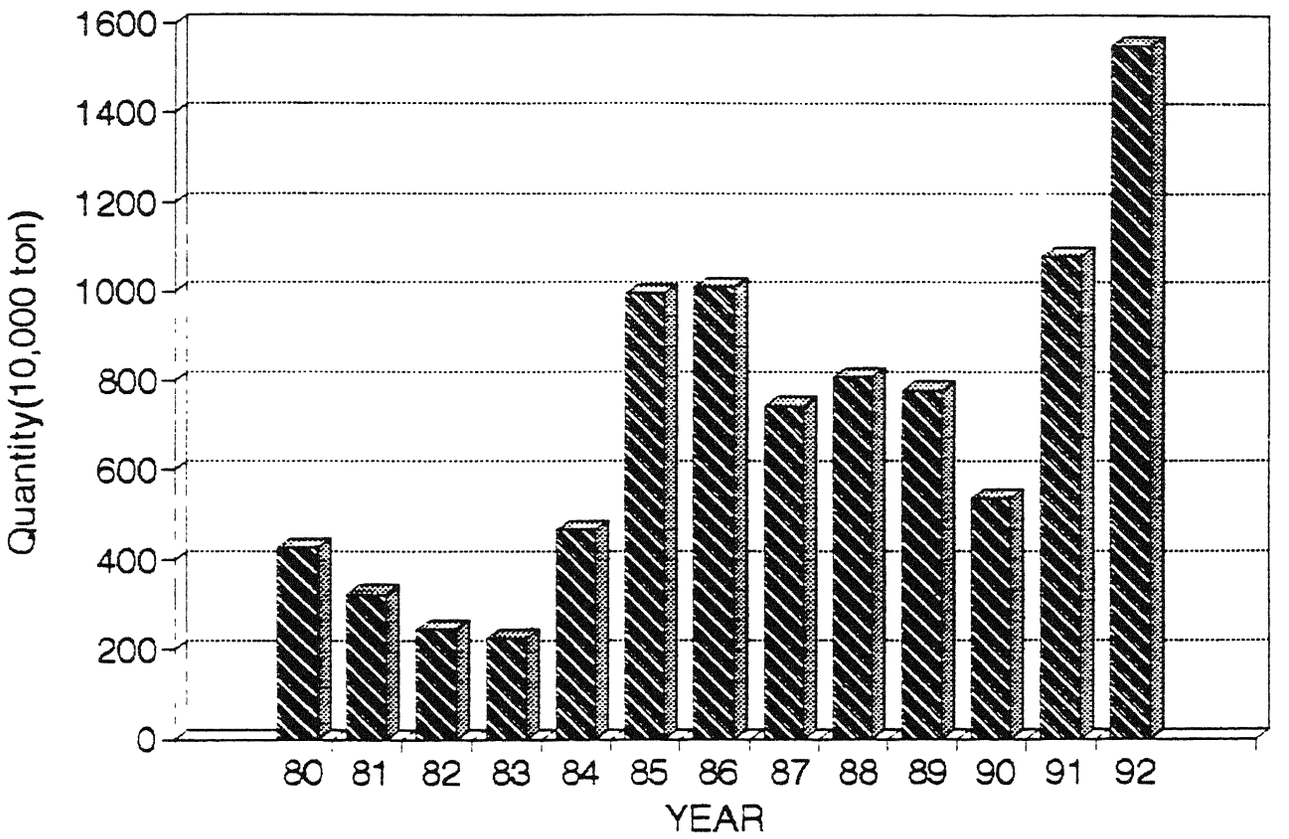


Figure 9

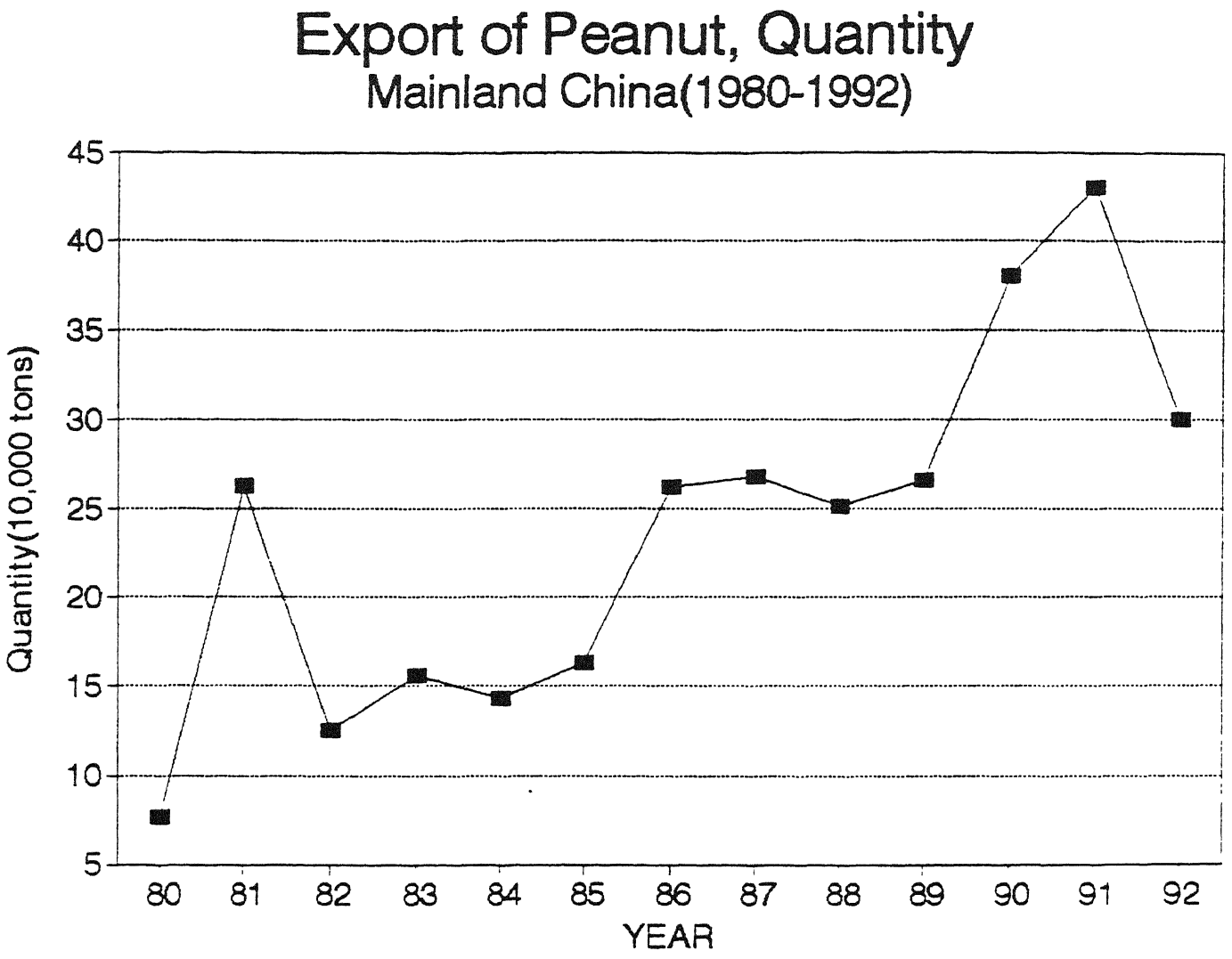

Export of Peanut, Quantity
Mainland China(1980-1992)
Quantity(10,000 tons)
45
40
35
30
25
20
15
10
5
80
81
82
83
84
85
86
87
88
89
90
91
92
YEAR

Figure 10

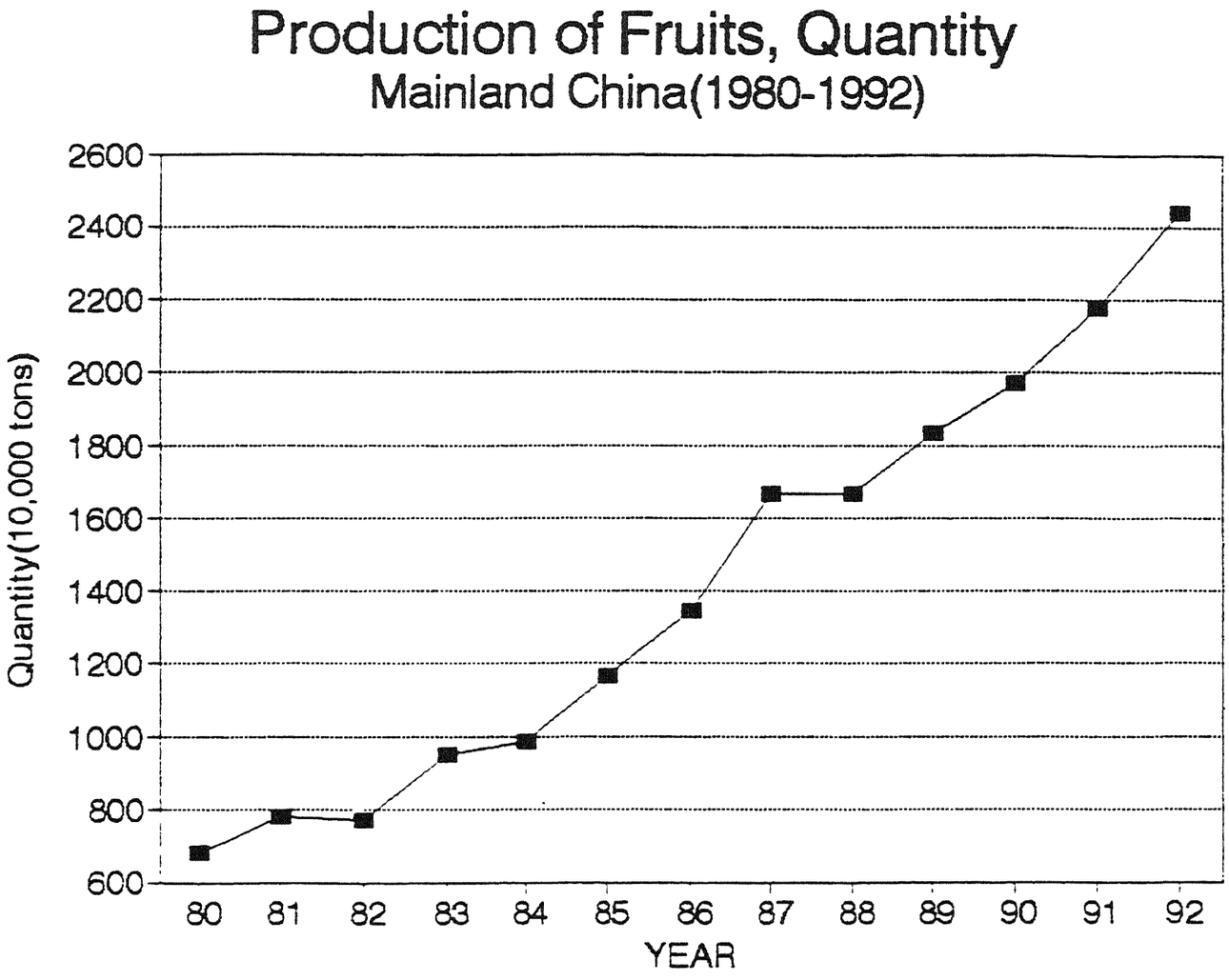

Production of Fruits, Quantity
Mainland China(1980-1992)
Quantity(10,000 tons)
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
80
81
82
83
84
85
86
87
88
89
90
91
92
YEAR

Figure 11

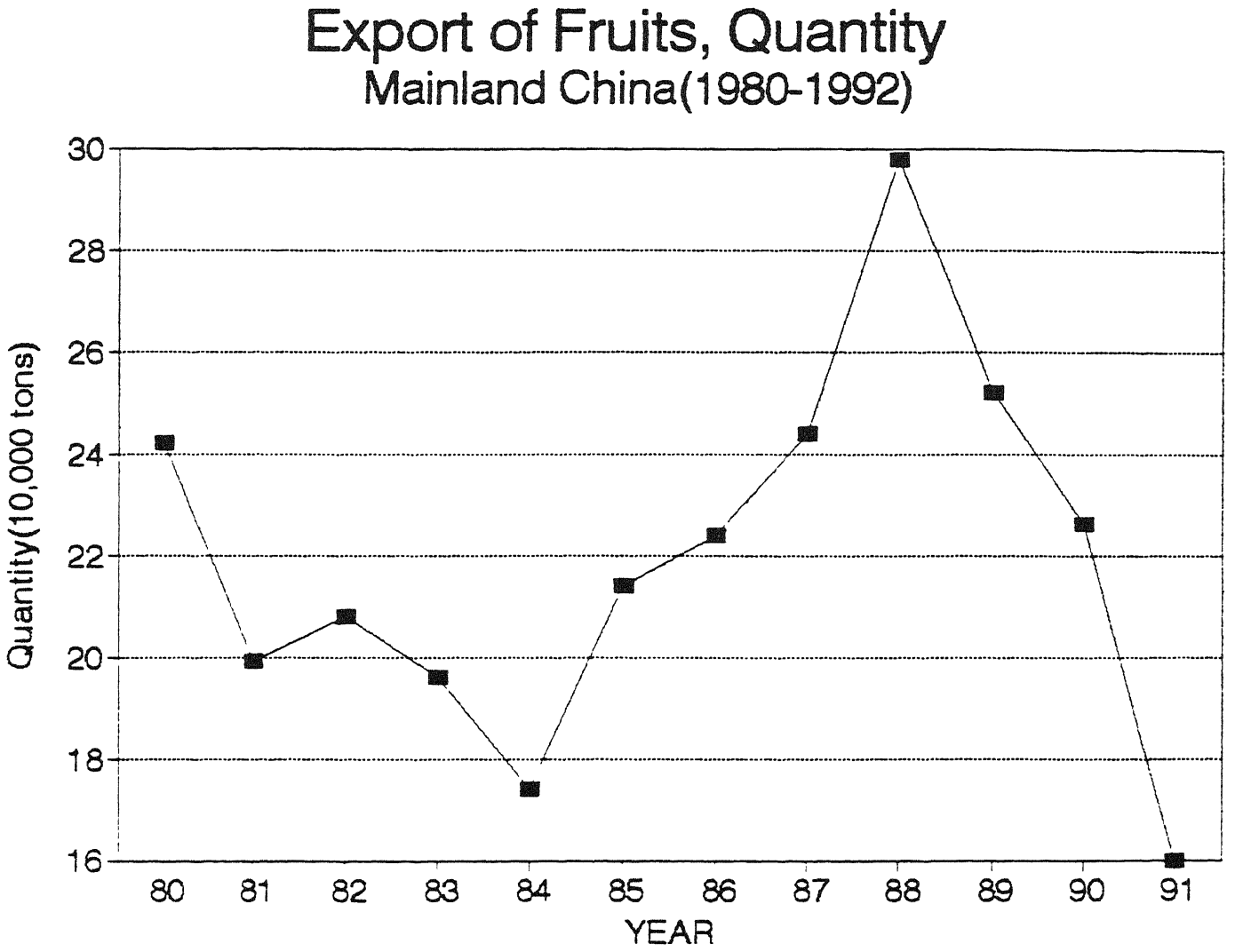

Export of Fruits, Quantity
Mainland China(1980-1992)
Quantity(10,000 tons)
30
28
26
24
22
20
18
16
80
81
82
83
84
85
86
87
88
89
90
91
YEAR

Figure 12

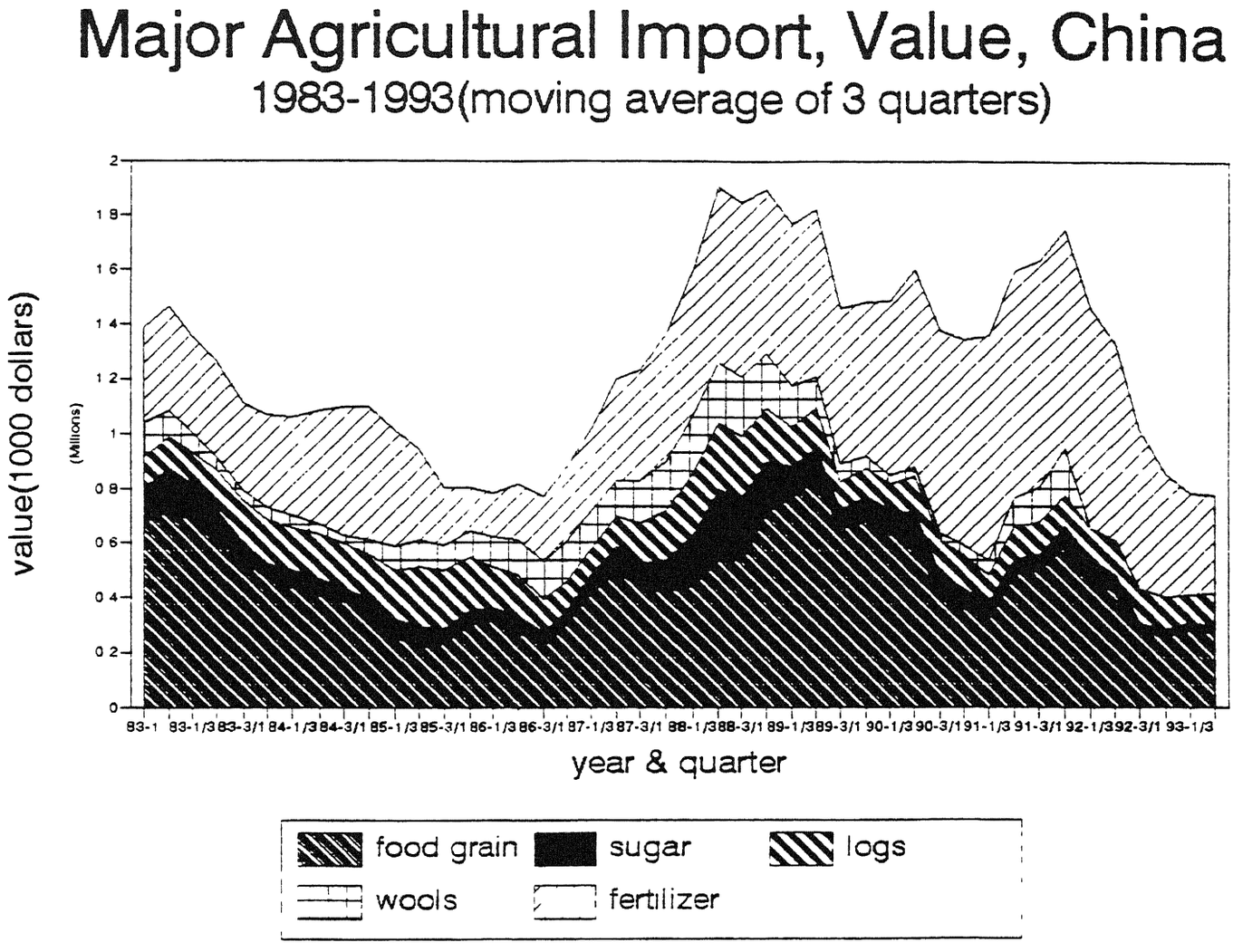

Major Agricultural Import, Value, China
1983-1993(moving average of 3 quarters)
value(1000 dollars)
(Millions)
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
83-1 83-1/3 83-3/1 84-1/3 84-3/1 85-1/3 85-3/1 86-1/3 86-3/1 87-1/3 87-3/1 88-1/3 88-3/1 89-1/3 89-3/1 90-1/3 90-3/1 91-1/3 91-3/1 92-1/3 92-3/1 93-1/3
year & quarter
food grain
sugar
logs
wools
fertilizer

Figure 13

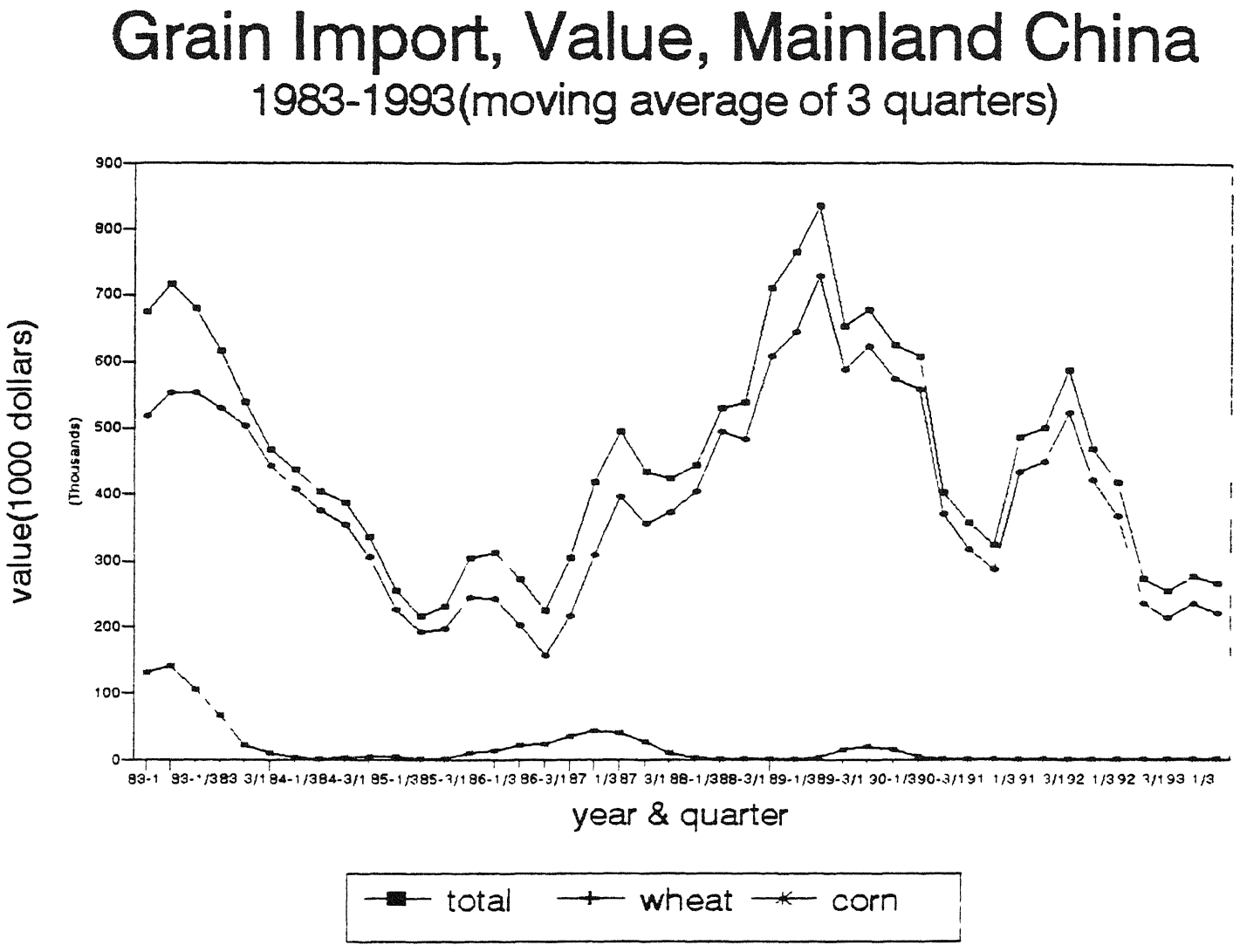
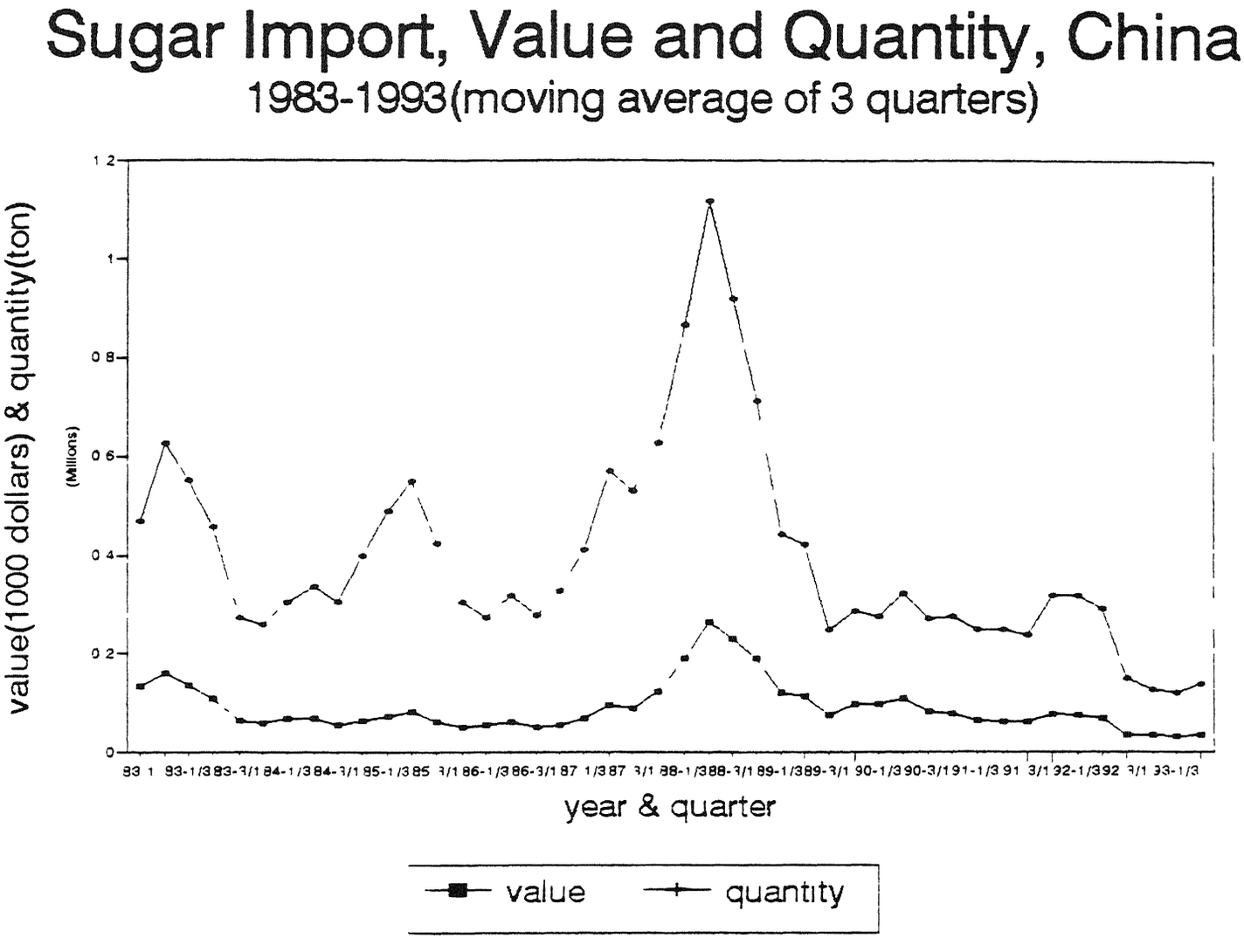

Grain Import, Value, Mainland China
1983-1993(moving average of 3 quarters)
value(1000 dollars)
(Thousands)
900
800
700
600
500
400
300
200
100
0
83-1 83-3/383 3/184-1/384-3/185-1/385-3/186-1/386-3/187 1/387 3/188-1/388-3/189-1/389-3/190-1/390-3/191 1/391 3/192 1/392 3/193 1/3
year & quarter
total
wheat
corn

Figure 14


Sugar Import, Value and Quantity, China
1983-1993(moving average of 3 quarters)
value(1000 dollars) & quantity(ton)
(Millions)
1.2
1
0.8
0.6
0.4
0.2
0
year & quarter
value
quantity

Sown Area, Output, and Relative Prices

The pattern of trade should be determined by comparative advantages. These comparative advantages can be reflected by the relative prices between the domestic market and foreign market. If the domestic price exceeds the world market price, the country should import. If the reversed situation occurs, the country should export.

Table 3 shows sown area and output for selected agricultural commodities in 1980 and 1990, and relative prices in 1990. As discussed earlier, Mainland China exported corn and rice but imported a substantial quantity of wheat. In 1990, the international market prices of rice and corn exceeded the domestic prices, especially for rice. In the case of wheat, the domestic and international prices were about the same. As noted earlier, Mainland China's agricultural production is constrained by limited arable land. As a result, the sown areas of major grains changed very little between 1980 and 1990. However, the total output of grains increased dramatically in this period, apparently due to the increases in productivity.

In 1990, the domestic price was notably lower than the international price for rice, tea, citrus, pork, beef, and mutton. These products, except beef and mutton, have had substantial exports. Based on these relative prices, one may expect that the government in Mainland China will in the future, push for exports of rice, tea, citrus and pork. One can also expect the domestic prices of beef and mutton to increase substantially in the future due to their supply constraint.

Table 3. Production and Prices of Major Agricultural Products in Mainland China

Product	Sown Area (million mu)		Output (million ton)		Domestic Market Price (Yaun/Ton)	International Market Price (Yuan/Ton)
	1980	1990	1980	1990	1990	1990
Rice	508.8	496.0	139.9	189.3	694.9	1,373.0
Wheat	438.4	461.3	55.2	98.2	623.6	655.4
Corn	315.3	321.0	62.6	96.8	472.4	521.6
Sorghum	40.4	23.2	6.75	5.7	503.0	502.3
Tea	15.6	15.9	0.3	0.5	6,364.0	9,816.4
Citrus	3.9	15.9	0.7	4.9	1,345.9	4,056.7
Pork			11.3	22.8	5,298.0	8,706.5
Beef			0.3	1.3	6,379.0	12,724.9
Mutton			0.4	1.1	6,146.0	13,145.9
Eggs			2.6	7.9	4,355.0	4,692.9
Peanut	35.1	43.6	3.6	6.4		
Soybeans	108.4	113.4	7.9	11.0		
Peanut oil					5,231.0	4,611.6

Notes:(1) Sources: (a) State Statistical Bureau, Agricultural Statistics of the People's Republic of China,1949-90.
(b) Ma Xiaohe, "The General Agreement in Tariffs and Trade and China's Agricultural Development," paper presented in the International Conference on China's Rural Reform and Developments in 1990s, Beijing, China, December 3-7, 1993. (In Chinese.)

(2) Exchange rate is based on the official average exchange rate in 1990, 1 U.S. dollar = 4.7838 Yuan.

(3) Domestic prices of pork, beef, mutton are domestic selling prices.

Econometric Models of Export Supply and Import Demand

In order to assess the factors affecting agricultural exports and imports in Mainland China, it is essential to estimate export supply and import demand functions. A large number of factors are potential sources that may affect trade behavior. Since the trade performance of a country is a combined result of the behaviors of all trade partners, all the factors that affect the related sellers and buyers will impose effect on its trade performance. In addition, domestic production and consumption may influence the trade behavior since export and import are actually caused by excess domestic supply and excess domestic demand. The involvement by the government in trade also complicates trade behaviors and make trade highly affected by policies. Carefully sorting out these key elements would provide a sound basis of building a satisfactory trade model.

In this section, we present the econometric results of estimation. Due to data limitations, the current model specifications are somewhat ad hoc. Specific limitation is due to the fact that we can not disaggregate the total imports and exports by China's trading partners (countries). Later, if data available, we plan to estimate the more vigorously specified export supply models based on a family of constant elasticity of transformation (CET) production possibility schedules (see Powell and Gruen, 1968). For import demand, we will adopt the Armington Model specification (See Armington, 1969). These models, of course, would require additional data on the countries of origin of imports and the countries of destination of exports.

Export Supply

While there exist a large number of studies on import demand behavior in international trade, only a limited number of studies on the supply side of trade have been conducted. Both single equation and simultaneous equation models have been applied in estimating export supply. However, the single equation model tends to perform less satisfactory than a simultaneous equation model in the context of export supply. Goldstein and Khan (1978) constructed a simultaneous equation model for estimating the export relationship. Following their approach, the simultaneous equation model for analyzing the export of an agricultural good in Mainland China can be specified as:

$$QXs = f(Px/Pd, Y \text{ or } Y_{t-1}, M, T, D) \quad (2)$$

$$QXd = f(Px/Pw; Yw \text{ or } Yw_{t-1}, Mw, Tw, Dw) \quad (3)$$

$$QXs = QXd \quad (4)$$

Equation (2) specifies the relationship of export supply, in which QXs is supply of export, Px is export price and Pd is domestic price, Y is domestic output, M is income, T represents some economic activities related to export of a particular good, D is seasonal or other kind of dummy variable. Equation (3) specifies the relationship of export demand by China's trade partner, in which Px is once again export price while Pw refers to the alternative price facing the trade partner, Yw refers to China's trade partner's output of the good to be estimated, while Mw is the weighted average income of China's trade partner, Tw is other economic variables and Dw donates dummy variables. Equation (4) is the equilibrium identity requirement.

Due to lack of data in specific trade partners of Mainland China at this time, only a single equation model is used to estimate export supply. The export supply function in double log form for this analysis is specified as:

$$\log QX = \lambda_0 + \lambda_1 \log (Px/Pd) + \lambda_2 \log Y + \lambda_3 \log M + \lambda_4 \log Fm + \lambda_5 \log QX\ t\text{-}1 + \lambda_6 D1 + \lambda_7 D2 + \lambda_8 D3 + U \quad (5)$$

where QX = Export volume of the good,

QX_{t-1} = Lagged export volume of the good,

Px = Unit value of the exported good,

Pd = Domestic retail price of the good,

Y = Per capita domestic output of the good,

M = Per capita income of urban households,

Fm = Imported quantity of fertilizers,

D1 = Quarterly dummy variable, having a value of one for the first quarter and zero, otherwise,

D2 = Quarterly dummy variable for the 2nd quarter,

D3 = Quarterly dummy variable for the 3rd quarter,

U = Disturbance term.

The income variable M may be replaced by the following variable:

GNP = Per capita GNP.

For vegetables, the output variable Y is replaced by the following variable:

A = acreage of the crop.

The dummy variables are relevant only when the models are estimated with quarterly data. Also, in few cases, the output variable Y, is replaced by the lagged output, Y_{t-1} in the annual model and Y_{t-2} in the quarterly model.

Since an increase in the price ratio (Px/Pd) will make export more profitable, it is expected that this variable is positively associated with export supply. Increase in domestic production will enhance the capacity of export, so Y should have a positive effect on QX. Due to the fact that more than half of the fertilizers applied on crops come from import, fertilizer import may have a positive or negative impact on the exports of crop products, especially grains, depending upon whether it is a strategy or a constraint to output expansion.

For some commodities such as pork, aquatic products, fruits and vegetables, urban household income, M is included because their domestic demands, particularly in urban areas, are believed to be highly elastic with respect to household income. Therefore, the income variable M should be negatively correlated with export supply. For several export commodities, the GNP variable perform better than the income variable in the model.

Both linear and double-log functions are estimated. The double-log functional form performs better (in terms of the statistical significance of the estimated parameters) for all commodities. We present and discuss here only the results from using the double-log form expressed in Eq. (4).

The export supply function is estimated using both annual data (13 or 12 observations, depending on the inclusion of a lagged variable) and quarterly data (40,

39, or 38 observations, depending on the presence of various lagged variables). The parameters are first estimated by the ordinary least squares (OLS). Since this is a time-series model, we need to examine the error structure for serial correlation. Specifically, the first-order autocorrelation is examined using the Durbin-Watson test and the Durbin-h test in the case where there is a lagged dependent variable. If the first order serial correction is detected as a specification problem, the errors are corrected for serial correction, and the estimation method is denoted as Autoreg.

The export supply model is estimated for the selected agricultural commodities, namely, grains, pork, soybeans, vegetables, fruits, and aquatic products. Both annual and quarterly models are presented whenever they are available. Table 4 shows the regression results for grains. The grains include mostly rice, corn, and soybeans. Both annual and quarterly models have a very good fit as adjusted R^2's are larger than 0.93. The results show that the estimated coefficients of the relative prices (Px/Pd) between foreign and domestic markets are negative (wrong sign, and not statistically significant in the annual model and marginally significant in the quarterly model). These results may be due to the fact that the price differentials have not been very large for grains as a whole with the exception of rice as noted earlier. Furthermore, exported grains consisted of high priced rice and lower priced corn and soybeans. The changing product mix may prevent accurate estimation of the true price-quantity relationship. The results further show that the lagged output is the most significant variable in explaining the export supply of grains in Mainland China. In the annual model, the fertilizer import variable, Fm, is significant and has a negative impact on the export supply of grains as

expected. But this variable is not statistically significant in the quarterly model. Also, in the quarterly models, the quarterly dummy variables are mostly significant. In both annual and quarterly models, the lagged dependent variables are all statistically significant. Therefore, the behavior of Mainland China's grain export is dynamic in nature. As expected, the speed of dynamic adjustment (i.e., one minus the coefficient of the lagged dependent variable) is slower in the quarterly model than the annual model. Based on the Durbin-h statistics, there is no first order autocorrelation in these dynamic export supply functions for grains.

Table 5 presents the selected regression results for pork. Since the lagged dependent variable is not significant, it was deleted in Versions A2 and B2. It is noted first that the annual models have a poor fit as R^2's are only about 0.36 and 0.45. The quarterly models improve R^2 substantially, particularly because of the distinctive seasonality in pork export. Mainland China exported less pork during the first quarter (January - March) but much more in the third quarter (July - September). The results show that the relative prices (Px/Pd) are highly significant. Specifically, an 1% increase in the export price of pork (relative to its domestic price) would increase Mainland China's export by 2.18% (annual model) or 2.10% (quarterly model). Urban households income (M) and output (Y) are all significant determinants of pork export. These results imply that increasing urban household income would decrease pork export.

Tables 6 presents the regression results for aquatic products. The overall fits of these export supply functions are very good despite the fact that they are estimated only with annual data of relatively few observations. The results show that the exports of

these products are significantly dependent upon the relative prices (Px/Pd) the domestic production (Y), and urban household income (M). Again, the results imply that higher export price and output would increase the exports of aquatic products while an increase in income would curtail export growth. Both dynamic and static models perform well for aquatic products. Note that in the dynamic model, long-run demand elasticities can be computed. Specifically, using A2, the estimated long-run elasticities for relative export price is 0.52 while the long-run elasticities of output and income are 2.88 and -2.38, respectively.

The export supply of vegetables is estimated with annual data only and the results are presented in Table 7. Despite a relatively high R^2, the only significant variable is vegetable acreage (A). Since exported vegetables consist of many varieties with very different prices, it may be very difficult to estimate export price elasticity at the aggregate level. The results indicate that if Mainland China is able to increase the acreage of vegetable production (by shifting from other crops), then vegetable export can be further increased.

Table 8 presents the regression results for fruits. The quarterly models (B1 and B2) have a substantially higher R^2 than the annual model. The dynamic model did not work well for fruits. The most troublesome result is that the relative price (Px/Pd) has a wrong sign and it is statistically significant in the annual model (A1). The problem may be due to either the simultaneity bias or the aggregation problem resulting from many varieties of fruits exported. The results show that the output and household income are significant factors, affecting fruit export. The estimated elasticities for these two

variables are very high in absolute values. As urban household income increases, the export of fruits would be reduced.

Tables 9 and 10 present the regression results for the two most important grains, soybeans and rice, respectively. Comparing to the export supply equations estimated for total grains (Table 4), R^2's for the soybeans and rice export equations are considerably lower. These results suggest that it would be more difficult to explain the variations of the exports of soybeans and rice than those of aggregate grains. The relative price variable still has a wrong sign in the estimated export equations for rice but it has a correct positive sign in the equations for soybeans. The regression results further reveal that output (lagged for 2 quarters) is the most important factor for rice export while the lagged export variable exhibits the strongest impact on soybean export.

Import Demand

Estimation of import demand has been the focus of many empirical studies of international trade behavior. Two kinds of models, single equation and simultaneous equations, are most commonly used in estimating import demand. Despite the possibility of simultaneous bias, a large portion of those studies used a single equation specification due to data limitation and ease of estimation. The study by Thursby and Thursby (1984) shows that single equation models are appropriate as long as they are well specified and they generate unbiased and/or consistent and efficient estimates. A comparison of nine types of single equation models of import demand in five countries

revealed that the models including dynamic behavior through the lagged value of dependent variable were frequently accepted.

The single equation model of import demand for agricultural commodities can be expressed as:

$$QM = f(Pm/Pd, Y, M, QM_{t-1}, D) \quad (6)$$

where, QM is value of imports demanded. Pm/Pd is the price ratio of import price to domestic price. Y is the domestic output of the good. M is urban household income. QM_{t-1} is the lagged value of imports and D represents quarterly dynamic variables. The assumption required for this single equation model is that import supply facing the importer is infinitely elastic.

For estimation, output variable Y may be replaced by Y_{t-1} or Y_{t-2} and M may be replaced by GNP. The variables Y, M, and GNP are all computed on a per capita basis.

It is expected that the price ratio of import to domestic prices will impose a negative effect on import, i.e., a higher ratio will lead to less import. Y_{t-1} is also expected to bring a negative effect on import. An increase in per capita M or GNP is supposed to raise the domestic demand and thus the import demand for the good.

The import demand equations are estimated for grains, wheat, and sugar and the regression results are presented in Tables 11 to 13. The estimated annual import demand functions for grains have a higher R^2 than the quarterly equations. The price ratio variable performs well in the model. The results show the imports of grains are significantly dependent upon the relative prices, lagged domestic output (only in the annual model), and per capita household income or GNP. The lack of significance of the

output variable in the quarterly model may be due to the ad hoc derivation of quarterly data from annual data. This apparently well fitted model of grain export suggests that the government in Mainland China had based on a thorough economic rationalization in deciding how much grains to import. The continuing increase in income is likely to be a major factor affecting Mainland China's grain import in the future.

Since a large fraction of imported grains was wheat, the estimated quarterly model of wheat import (Table 12) show many similarities to the quarterly equations for total grains (Table 11). In particular, the price ratio variable is highly significant and the dynamic model works very well for both wheat and total grains. The statistical fit (R^2) is not as good as those for total grains, a similar phenomenon observed for export supply as well.

The regression results for sugar (Table 13) show that the quarterly model improves statistical fit over the annual model. As shown in Model B3, after autocorrelation is corrected, the only statistically significant variable is output (Y). Based on this result, one may conclude that the import demand for sugar in Mainland China would depend upon its domestic production. The estimated impacts of price and household income on sugar import are sensitive to model specification although they all have the correct sign.

Table 4. Estimated Export Supply of Grains, Mainland China[a]

Dependent Variable: Log QX
Annual Data: 1980-1992
Quarterly Data: 1983-1992

Explanatory Variables and Statistics	Annual Model		Quarterly Model		
	A1 (OLS)	A2 (OLS)	B1 (OLS)	B2 (OLS)	B3 (OLS)
Intercept	-44.137 (-8.53)***	-48.109 (-7.46)***	-15.926 (-3.41)***	-14.104 (-3.24)***	-14.925 (-3.36)***
Log(Px/Pd)	-0.263 (-0.95)	-0.219 (-0.60)	-0.320 (-1.76)*	-0.299 (-1.67)*	
$LogY_{t-1}$	7.730 (8.21)***	8.824 (8.10)***			
$LogY_{t-2}$			3.090 (3.77)***	2.614 (3.65)***	2.666 (3.62)***
Log GNP	1.311 (2.46)**		0.228 (0.73)		
Log QX_{t-1}	0.423 (4.11)***	0.665 (11.89)***	0.801 (9.57)***	0.836 (15.25)***	0.898 (21.88)***
Log Fm	-0.675 (-3.37)***	-0.224 (-2.11)*	-0.133 (-1.08)		
D1			-0.262 (-3.50)***	-0.240 (-3.35)***	-0.259 (-3.58)***
D2			0.266 (3.65)***	0.276 (3.88)***	0.265 (3.64)
D3			-0.110 (-1.56)	-0.118 (-1.71)*	-0.128 (-1.81)*
Adj-R^2	0.9912	0.9847	0.9342	0.9356	0.932
DW	1.996	2.077	2.291	2.186	2.137
Durbin-h	0.067	-0.137	-1.06	-0.609	-0.436

[a]Estimated t values are in parentheses; DW is the Durbin-Watson statistic.
***, ** and * denote significance at 1%, 5% and 10% level, respectively.

Table 5. Estimated Export Supply of Pork, Mainland China[a]

Dependent Variable: Log QX, Annual Data: 1980-1992, Quarterly Data: 1983-1992

Explanatory Variables and Statistics	Annual Model		Quarterly Model	
	A1 (OLS)	A2 (OLS)	B1 (OLS)	B2 (OLS)
Intercept	24.92	16.174	29.511	31.425
	(2.84)**	(2.21)	(5.47)***	(7.18)***
Log(Px/Pd)	2.027	2.18	1.978	2.104
	(3.21)**	(3.14)**	(5.09)***	(6.43)***
Log Y	5.246	3.717	4.389	4.615
	(2.59)**	(1.98)*	(4.07)***	(4.57)***
Log M	-7.601	-4.915	-6.502	-6.823
	(2.598)**	(2.0)*	(-4.39)***	(-4.97)***
Log QX_{t-1}	0.419		0.089	
	(0.87)		(0.62)	
D1			-0.205	-0.223
			(-1.59)	(-1.80)*
D2			0.064	-0.010
			(0.43)	(-0.08)
D3			0.285	0.265
			(2.27)**	(2.20)**
Adj-R^2	0.4534	0.3690	0.6181	0.6255
DW	2.146	1.976	1.790	1.653
Durbin-h	[b]		1.56	

[a]Estimated t values are in parentheses; DW is the Durbin-Watson statistic.
[b]Durbin-h statistic can not be computed because of a negative number in the squared root (an imaginary number).
***, ** and * denote significance at 1%, 5% and 10% level, respectively.

Table 6. Estimated Export Supply of Aquatic Products, Mainland China[a]

Dependent Variable: Log QX
Annual Data: 1980-1992

Explanatory Variables and Statistics	Alternative Annual Models			
	A1 (OLS)	A2 (Autoreg)	A3 (OLS)	A4 (Autoreg)
Intercept	2.97 (0.67)	5.833 (1.91)*	10.32 (3.36)***	12.41 (5.15)***
Log(Px/Pd)	0.270 (1.31)	0.349 (2.09)*	0.696 (2.44)**	0.623 (3.49)***
Log Y	1.428	1.934	2.892	3.198
	(1.9)*	(3.73)***	(7.33)***	(10.82)***
Log M	-0.865	-1.583	-2.681	-3.236
	(-0.79)	(-2.08)*	(-3.55)***	(-5.57)***
Log QXt-1	0.431	0.330		
	(2.16)*	(2.61)**		
ϱ		0.677 (2.24)*		0.475 (1.47)
Adj-R^2	0.9758	0.986	0.968	0.975
DW	2.671	1.815	2.56	2.232
Durbin-h	1.61	0.356	[b]	[b]

[a]Estimated t values are in parentheses; DW is the Durbin-Watson statistic; ϱ is the first order autocorrelation efficient.
[b]Durbin-h statistic can not be computed because of a negative number in the squared root (an imaginary number).
***, ** and * denote significance at 1%, 5% and 10% level, respectively.

Table 7. Estimated Export Supply of Vegetables, Mainland China[a]

Dependent Variable: Log QX
Annual Data: 1980-1992

Explanatory Variables and Statistics	Vegetables		
	A1 (OLS)	A2 (OLS)	A3 (Autoreg)
Intercept	2.307	-10.301	-10.278
	(0.27)	(-3.54)	(-3.18)*
Log (Px/Pd)	-0.106	0.587	0.471
	(-0.15)	(0.91)	(0.76)
Log A	-0.487	1.585	1.607
	(-0.28)	(6.48)	(5.34)*
Log QX_{t-1}	0.676		
	(1.62)		
Log GNP	0.654		
	(0.48)		
ϱ			-0.224
			(-0.69)
Adj-R^2	0.896	0.862	0.862
DW	1.642	1.064	1.064

[a]Estimated t values are in parentheses; DW is the Durbin-Watson statistic; ϱ is the first order autocorrelation coefficient.
*Denotes significance at 5% level.

Table 8. Estimated Export Supply of Fruits, Mainland China[a]

Dependent Variable: Log QX, Annual Data: 1980-1991, Quarterly Data: 1983-1991

Explanatory Variables and Statistics	Annual Model	Quarterly Model	
	A1 (OLS)	B1 (OLS)	B2 (OLS)
Intercept	10.233	11.420	14.028
	(4.11)***	(3.92)***	(6.13)***
Log(Px/Pd)	-1.554	-0.782	-0.848
	(-4.15)***	(-1.86)*	(-1.99)
Log Y_{t-2} (Log Y for model A1)	0.843	2.123	2.545
	(1.13)	(2.05)**	(2.54)**
Log GNP (Log M for model B2)	-2.383	-2.732	-3.109
	(-2.40)**	(-2.02)**	(-2.31)**
Log QX_{t-1}	0.460	0.258	
	(1.70)	(1.36)	
D1		-1.368	-1.118
		(-5.97)***	(-8.07)***
D2		-2.181	-2.281
		(-14.19)***	(-16.63)***
D3		-0.580	-0.932
		(-2.01)**	(-7.20)***
Adj-R^2	0.6632	0.9051	0.9022
DW	2.288	2.193	1.734
Durbin-h	-1.083		[b]

[a]Estimated t values are in parentheses; DW is the Durbin-Watson statistic.
[b]Durbin-h statistic can not be computed because of a negative number in the squared root (an imaginary number).
***, ** and * denote significance at 1%, 5% and 10% level, respectively.

Table 9. Estimated Export Supply of Soybeans, Mainland China[a]

Dependent Variable: Log QX, Annual Data: 1980-1991, Quarterly Data: 1983-1991

Explanatory Variables and Statistics	Annual Model		Quarterly Model
	A1 (OLS)	A2 (OLS)	B1 (OLS)
Intercept	2.158	-25.673	-1.727
	(0.23)	(-5.29)***	(-2.39)**
Log(Px/Pd)	1.151	0.900	0.405
	(1.27)	(0.70)	(0.78)
Log Y	0.207	3.828	0.689
	(0.12)	(2.15)**	(0.91)
Log M	-0.339	4.144	
	(-0.22)	(4.12)***	
Log QX_{t-1}	0.855		0.550
	(3.43)***		(4.11)***
D1			0.283
			(1.74)
D2			0.569
			(2.61)***
D3			-0.078
			(-0.47)
Adj-R^2	0.8378	0.7433	0.5292
DW	1.931	1.726	2.262
Durbin-h	0.237		1.489

[a]Estimated t values are in parentheses; DW is the Durbin-Watson statistic.
***, ** and * denote significance at 1%, 5% and 10% level, respectively.

Table 10. Estimated Export Supply of Rice, Mainland China[a]

Dependent Variable: Log QX
Quarterly Data: 1983-1992

Explanatory Variables and Statistics	Alternative Quarterly Models		
	A1 (OLS)	A2 (OLS)	A3 (OLS)
Intercept	-22.127 (-2.56)**	-15.065 (-1.79)*	-14.053 (-1.65)*
Log(Px/Pd)	-1.072 (-2.50)**	-0.647 (-1.47)	
Log Y_{t-2}[b]	5.163 (3.24)***	2.867 (2.01)**	2.626 (1.82)*
Log GNP	0.252 (0.74)		
Log Fm	-0.464 (-2.43)**		
Log QX_{t-1}	0.582 (5.29)***	0.741 (7.06)***	0.776 (7.46)***
D1	-0.759 (-5.29)***	-0.749 (-4.82)***	-0.822 (-5.48)***
D2	-0.077 (-0.57)	-0.042 (-0.29)	-0.072 (-0.48)
D3	-0.314 (-2.44)**	-0.335 (-2.38)**	-0.352 (-2.46)**
Adj-R^2	0.7315	0.6742	0.6624
DW	2.015	1.905	1.995
Durbin-h	-0.063	0.384	0.02

[a]Estimated t values are in parentheses; DW is the Durbin-Watson statistic.
[b]Y_{t-2} refers to per capita output of grains lagged for two quarters back.
***, ** and * denote significance at 1%, 5% and 10% level, respectively.

Table 11. Estimated Import Demand for Grains, Mainland China[a]

Dependent Variable: Log QM, Annual Data: 1980-1992, Quarterly Data: 1983-1992

Explanatory Variables and Statistics	Annual Model		Quarterly Model	
	A1 (OLS)	A2 (autoreg)	B1 (OLS)	B2
Intercept	23.445 (4.49)***	20.037 (5.99)***	1.841 (0.22)	2.276 (1.86)*
Log(Pm/Pd)	-1.350 (-4.11)***	-1.207 (-4.90)***	-1.259 (-3.26)***	-1.252 (-3.53)***
$LogY_{t-1}$	-3.720 (-3.95)***	-3.954 (-5.72)***	0.073 (0.05)	
Log GNP (Log M for model A2)	0.496 (2.93)**	1.139 (4.86)**	0.388 (1.69)*	0.387 (1.72)*
Log QX_{t-1}	0.411 (3.18)**	0.487 (5.73)***	0.442 (3.23)***	0.443 (3.30)***
D1			-0.157 (-1.16)	-0.157 (-1.18)
D2			0.285 (2.10)**	0.285 (2.14)**
D3			-0.082 (-0.61)	-0.082 (-0.62)
ϱ		0.5578 (1.62)*		
Adj-R^2	0.8245	0.8064	0.5423	0.5570
DW	2.539	2.7264	2.095	2.095
Durbin-h	-1.04	-1.321	-0.571	-0.544

[a] Estimated t values are in parentheses; DW is the Durbin-Watson statistic; ϱ is the first order autocorrelation coefficient. ***, ** and * denote significance at 1%, 5% and 10% level, respectively.

Table 12. Estimated Import Demand for Wheat, Mainland China[a]

Dependent Variable: Log QM
Quarterly Data: 1983-1992

Explanatory Variables and Statistics	Alternative Quarterly Models		
	A1 (OLS)	A2 (OLS)	A3 (OLS)
Intercept	1.085 (0.12)	0.481 (0.33)	2.621 (2.61)**
Log(Pm/Pd)	-1.025 (-2.56)**	-1.032 (-2.75)***	-0.652 (-1.95)*
Log Y_{t-2}[b]	-0.099 (-0.07)		
Log GNP	0.557 (1.87)*	0.560 (1.95)*	
Log QX_{t-1}	0.545 (3.92)***	0.544 (3.99)***	0.663 (5.21)***
D1	-0.193 (-1.28)	-0.193 (-1.30)	-0.214 (-1.38)
D2	0.308 (2.02)**	0.308 (2.05)**	0.322 (2.06)**
D3	-0.063 (-0.43)	-0.063 (-0.43)	-0.092 (-0.62)
Adj-R^2	0.4911	0.5074	0.4642
DW	1.932	1.931	1.936
Durbin-h	0.407	0.392	0.318

[a]Estimated t values are in parentheses; DW is the Durbin-Watson statistic.
[b]Y_{t-2} refers to per capita output of grains lagged for two quarters.
***, ** and * denote significance at 1%, 5% and 10% level, respectively.

Table 13. Estimated Import Demand for Sugar, Mainland China[a]

Dependent Variable: Log QM, Annual Data: 1980-1992, Quarterly Data: 1983-1992

Explanatory Variables and Statistics	Annual Model	Quarterly Model		
	A2 (OLS)	B1 (OLS)	B2 (OLS)	B3 (Auto)
Intercept	6.126 (7.09)**	3.941 (1.69)*	-8.441 (-1.36)	2.207 (0.25)
Log(Pm/Pd)	-1.037 (-2.10)**	-0.658 (-1.57)	-0.857 (-1.94)*	-0.627 (-1.19)
Log Y	0.249 (0.49)	-1.609 (-2.55)**	-2.437 (-2.79)**	-2.494 (-2.09)**
Log GNP (Log M for Model B2,B3)		1.197 (2.33)**	3.821 (2.55)**	2.738 (1.39)
Log QM_{t-1}		0.358 (2.25)**	0.374 (2.46)**	
D1		-0.391 (-2.29)**	-0.390 (-2.33)**	-0.379 (-2.52)**
D2		0.507 (2.82)**	0.520 (2.95)***	0.292 (1.77)*
D3		0.084 (0.51)	0.082 (0.50)	0.119 (0.82)
ϱ				-0.3755 (-2.29)**
Adj-R^2	0.1948	0.5411	0.5543	0.4844
DW	1.690	1.858	1.959	1.5915
Durbin-h	[b]	3.94	0.407	[b]

[a]Estimated t values are in parentheses; DW is the Durbin-Watson statistic; ϱ is the first order autocorrelation efficient.
[b]Durbin-h statistic can not be computed because of a negative number in the squared root (an imaginary number).
***, ** and * denote significance at 1%, 5% and 10% level, respectively.

Conclusions

This report documents the research progress made during the first year for the project sponsored by the Council of Agriculture (COA). Considerable efforts were made to develop data bases needed for various econometric estimations. We have collected aggregate data (annual and quarterly) and provincial data (annual and household-level) for Jiangsu, Fujian, and Shandong. These data collecting activities are by no means completed. In this report, the data collected so far are presented and analyzed.

The objective of this project is to analyze the potential of agricultural trade between Taiwan and Mainland China. However, since there has not been any direct trade between Taiwan and Mainland China, the analysis of this trade relationship has to be based on the understanding of the overall agricultural trade behavior in Mainland China. During 1980-1992, Mainland China's agricultural exports increased very rapidly, especially for rice, corn, vegetables, pork and aquatic products. However, these exports fluctuated widely during this period, especially for live hogs, pork, soybeans, peanuts, and fruits. These fluctuations represent great uncertainties in assessing the future agricultural trade patterns in Mainland China.

In order to understand the key factors affecting the agricultural exports and imports in Mainland China, export supply and import demand functions are estimated for selected commodities, using both annual and quarterly data. The regression results provide many interesting findings. Specifically the exports of grains (rice, corn, and soybeans) are found to be determined mostly by domestic output rather than relative

prices. On the other hand, the relative prices (export price over domestic price) are the key factors affecting the exports of pork and aquatic products in Mainland China. The results reveal further that the exports of vegetables are affected by output, not prices. However, the export of fruits were very responsive to output and income and also somewhat sensitive to the relative prices. The results also indicate that increasing income in the future would reduce the exports of pork, aquatic products and fruits.

The estimated import demand for grains shows that the import of grains (mostly wheat) was determined by relative prices, domestic output, and per capita household income. Increasing income would be the key factor for increasing wheat import in the future. On the other hand, the import demand for sugar is shown to be affected mostly by output and weakly by income and relative prices.

References

Armington, P.S. "A Theory of Demand for Products Distinguished by Place of Production." International Monetary Fund Staff Papers. (March 1969): 159-178.

Boot, C. G., W. Feibes and J.H.C. Lisman "Further Comments on the Derivations of Quarterly Figures from Annual Data." Applied Statistics. 16 (1967): 65-75.

Chen, Liang Yu and Allan Buckwell. Chinese Grain Economy and Policy. Wallingford, UK: C.A.B. International, 1991.

Chern, Wen S. and Guijing Wang. "The Engel Function and Complete Food Demand System for Chinese Urban Households." China Economic Review. 5 (Spring 1994): 35-57.

Chou, Yi, Chyau Tuan, and L.H. Lu. A Study of Mainland China's Imports and Exports of Agricultural Products. Chung-Hua Institution for Economic Research, Taipei, Taiwan, 1990. (In Chinese).

Colby, W. Hunter, Frederick W. Crook, and Shwu-Eng H. Webb. Agricultural Statistics of the People's Republic of China, 1949-90. Economic Research Service, U.S.

Department of Agriculture. Statistical Bulletin No. 844. Washington D.C. December 1992.

Ginsburgh, V.A. "A Further Note on the Derivation of Quarterly Figures Consistent with Annual Data." 22 (1973): 369-373.

Goldstein, M. and M.S. Khan, "The Supply and Demand for Exports: A Simultaneous Approach," Review of Economics and Statistics, 60 (May 1978): 275-286.

Lisman, J.H.C. and J. Santee "Derivation of Quarterly Figure from Annual Data." Applied Statistics. 13 (1964):87-90.

Powell, Alan A. and T. A. G. Fruen, "The Constraint Elasticity of Transformation Production Frontier and Linear Supply System." International Economic Review, 9 (October, 1968):315-328.

Thursby, J. and M.C. Thursby. "How Reliable Are Simple, Single Equation Specification of Import Demand?," The Review of Economics and Statistics, 66 (February 1984): 120-128.

Appendix A

Review of Two Major Studies

I. A Review of the Book Entitled, "Chinese Grain Economy and Policy," by L. Y. Chen and A. Buckwell (C.A.B. International, 1991).

A great body of literatures have evolved in the last decade in addressing the issues related to Mainland China's agriculture. One of the most common topics in this literature is grain economy. In the recent study "Chinese Grain Economy and Policy" by Chen and Buckwell (1991), a very detailed and comprehensive analysis on the key issues relating to grain economy and policy was conducted.

The prime objective of this study, as indicated by the authors, is to provide a detailed examination of the effect of policy on China's grain economy. The analysis, based on the historical data from 1953 to 1985, was conducted in four specific contexts including grain production, consumption, export, and import. The quantitative technique, basically the regression models, is widely used in this study. Due to the specific features of China economic system, great attentions were paid to the specification of those models.

Aggregate Grain Supply Response model

The analysis of grain supply response is the focus of this study. Three models, aggregate supply model, sector supply and regional supply model, were established to

evaluate the response of producers, both at national level and regional level, and both as a producer of grain as a whole and producer of rice, wheat, soybean and other grain crops, to the changes of the relevant factors including government policies, technological improvements and natural environments.

i. Aggregate Supply Model

The aggregate supply model was specified as follow:

Y = f(P, P1, P2, A, T, W, D)

where

Y = the output of grain;

P = grain purchasing price;

P1 = price ratio of purchasing price of grain over cotton;

P2 = price ratio of purchasing price of grain over selling price of fertilizer;

A = grain growing (sown) area;

T = a time tread variable for technological improvement;

W = the crop growing area which suffered from natural calamities resulting in 30% or more reduction in yield;

D = a dummy variables for different policy eras, D1=1 for 1959-61, D2=1 for 1962-65, D3=1 for 1966-77, D4=1 for 1978-84.

Both linear and log-linear functions forms were performed but the analysis was mainly based on the estimation from the linear functions because of its better statistical

fit. By adding or deleting one or two the above specified variables, several equations were tried to see which one is best in line with the empirical results. Time series data from 1952 to 1984 collected by the State Statistical Bureau (SSB) was used to estimate the parameters in the model. The major conclusions are:

1) The results showed that the variables including purchasing price, growing area, and time trend variable are statistically significant and positively associated with grain output.

2) The positive sign of the price coefficient indicates that, in addition to self-subsistence, profitability is also a factor that affect the producer's response. However, the magnitude of the coefficient obtained from the model may not exactly reflect the true magnitude of the price effect mainly because of the existence of a compulsory purchasing system. Under this system, producers have few options to respond to the price change since they are required to sell a large fixed amount of products to the state regardless of the price. So, cautions must be given in interpreting the result. The derived price elasticities range from 0.35 to 0.57, indicating that the response of grain production to price is inelastic.

3) The estimations were based on current, nominal prices rather than the real ones. An attempt was made to estimate the price effect in real terms but it turned out to be unsatisfactory and unacceptable. Lack of accuracy and consistence of the price index were blamed for this result.

4) The price ratio of grain over the competitive crops and of grain over inputs are supposed to bring positive effects on grain output, but the results from the models are the opposite. The justification for these results made by the authors is that the effect of price ratio was offset by that of nominal price. In the period between 1952 to 1983, these price ratios were used by the government as one of several instruments to achieve, though may not be successful, different strategies. When the priority was given to heavy industry, a relatively high price ratio of grain over its rival and inputs were associated with low nominal price of grain to favor the heavy industry but without seriously influencing the grain output. On the other hand, when the favorable condition was given to agriculture, a relative low price ratio coincided with high nominal grain price. If this argument is true, the effect of price must also be partially depressed by the price ratio. That means that the coefficient and the derived price elasticity should be higher in the case when there is no effect of the price ratio and when the price ratio and price have moved closely together.

5) The results show that one more hectare of sown area would contribute to an increase in 1.3-1.4 tons of output. However, each additional hectare of growing crops suffering from natural disaster will lead to a loss of 1.6-1.8 tons of grain. Given the high percentage of growing area (10-20% of the total) suffering from natural disaster each year and less uncultivated land left in China, more efforts should be devoted to controlling the disasters.

6) The time trend variable that reflect the technology improvement imposes a strong positive effect on grain output. About 8 million tons more grain output were achieved from this source each year. This was about one third of the average output increase from 1980 to 1984.

7) The effect of policy variables was found statistically insignificant. The authors argued that the policy effect was already captured by the two price ratios, which represent two alternative policy patterns (one policy favored agriculture and the alternative did the opposite).

ii. Grain Sector Output Response Model

Four sector output response models were established to test the production relationships for rice, wheat, soybeans and other grain crops. Rice is the most important grain crop in China and it is mainly grown in the south of China, while wheat is another important grain crop which is mainly cultivated in the north. The model specifications for rice and wheat are very similar to that of aggregate model. Due to lack of data on sown area suffered from natural disasters for specific crops including rice and wheat, the total sown area impacted by natural disasters was used in the sectoral model. Once again, several equations were tried but the analysis was mainly based on the preferred ones. The major conclusions can be summarized below.

1) The signs of the estimated coefficients in both rice and wheat models are the same as that in the aggregate model. And all the coefficients were found to be statistically significant.

2) The price elasticity of rice supply is lower than that of grain as a whole, the opposite is true for wheat, but both of them have a price elasticity less than unity. More strict requirement on growing conditions of rice over wheat may be one factor that responsible for this difference. Another reason is that wheat has relative more competitive crops than rice.

3) The marginal land productivity of wheat was found to be higher than that of rice, which indicates that wheat has greater potential for yield increase than rice.

iii. Regional Output Response Model

Two counties, Pindu county of Shandong province and Jianou county of Fujian province, was used for the purpose of regional analysis. The former is a typical grain growing area in the north while the latter is well representative of the south. The model was specified in the same way as that for the nation. The data for the regional model is also from the same period as that of the aggregate model (1953-1985).

The results from the regional models present a similar picture as those from the aggregate model, except the small difference on the magnitude of coefficients. In Pindu of Shandong province, due to greater effort devoted to improving grain technology,

grain output shows a stronger response to the technology variable than the national average. Similarly, due to a more extensive use of land, the marginal productivity of land is lower as compared with the national level. The basic conclusion derived from Jianou county of Fujian province is the same as that of Pindu county and the whole nation.

Domestic Consumption of Grain Products

Four factors, domestic production, population growth, price of grain products and personal disposable income, are the common factors which are believed to affect the grain consumption. In this study, an attempt was made to verify the relationship between domestic consumption of grain and the above four factors in the context of China based on the following econometric models:

$$Ci = f(Q, PO, I, P)$$

Ci refers to the consumption of grain (total or per capita), while Q refers to grain output in the previous year, PO is total population, I represents income and P denotes price. The model was run in the context of urban area, rural area and the nation as a whole. Data covers the period of 1952-1983.

i. Results From the Urban Consumption Model

Both aggregate data and per capita data were used as the dependent variable in the model. Followings are the main conclusions:

1) All the coefficients have the expected sign. Namely, consumption of grain in urban area is positively associated with grain production in the previous year, urban population and personal income but negatively related with price.

2) However, the coefficients of personal income were found statistically insignificant in both aggregate term and per capita term. Grain rationing system was blamed for this result. Under this system, the response of income to consumption was sterilized since the consumption was restricted within the fixed quota assigned to each consumer. So, the income effect estimated from this model is most likely to be underestimated.

3) Serial correlation in the error terms was found in the models, indicating the existence of problems with the specification.

ii. Result From Rural Consumption Model

The estimated models obtained based on the aggregate data were found statistically unsatisfactory. So the analysis was based on the per capita term. The basic results associated with the variables Q, PO, and P are similar to that from the urban model. One significant difference from urban model is that the income coefficient was found to be statistically significant and positively associated with grain consumption. The absence of grain rationing system in the rural area may be the element that makes this difference.

iii. Result From Aggregate Grain Consumption Model

In combination of urban and rural sectors, the consumption relationship was tested in the context of the whole nation. Although all the coefficients have the expected sign and statistically significant, the effect of both variables of personal income and grain price on grain consumption were found very unresponsive. If this result is mainly because of sterilized supply and demand market, then little insight can be generated from the model to grain consumption since 1984 in which both the supply and demand market become more liberalized. Consequently, further application of this model to the period after 1984 will be inappropriate.

Grain Import and Export

Grain trade has been the major component of agricultural trade in China. Exporting rice and importing wheat has been the basic grain trade pattern during the last two decades, though corn export shows a strong upswing in recent years. In this study, an econometric analysis of rice export, wheat import and net grain trade was attempted.

i. Rice Export Model

The export model for rice is specified as follows:

RX = f(P1 and/or P2 and/or P3, Q1 or Q2 or Q3, C, D)

P1 refers to the world market price of rice; P2 and P3 are the price ratios of rice export over wheat import and rice export over fertilizer import, respectively; Q1 refers to rice output in the previous year; Q2 is two year average output, while Q3 is rice output in the current year; C is the domestic grain consumption; D is a dummy variable representing the general trade climate. Several equations were tried by combining the above variables. Data covers the period from 1961 to 1983. Major results include:

1) Although the coefficients of all the three output variables were found statistically significant, the output with one year lag should be more economically reasonable since the source of rice export is mainly from the harvest in the previous year. However, the magnitudes of the coefficients are very low. To be more specific, one unit increase in grain output only results in an increase of 0.009-0.021 units in export.

2) As expected, rice export positively responds to the world market price and the two price ratios. Each of these price variables show to be statistically significant when only itself is included in the equation. Only one price signal was found significant when two or more were included, indicating that one price signal is able to capture most of the price effect. This is especially true when all of them have been moving in the same direction. The own price elasticity was found to be high. Most of the preferred equations give an elasticity greater than unity, indicating that price change will impose crucial effect on rice export.

3) Rice export responds negatively to domestic consumption, but the magnitude is extremely low. When domestic consumption increases by one unit, rice export will only decrease by 0.011 to 0.055 units.

ii. Wheat Import Model

Wheat import (WI) was specified as a function of grain output (Q), grain consumption (C), world market price (P1) and/or the price ratio of wheat import over rice export (P2) and wheat import over fertilizer import (P3), and general trade climate (D=1 for 1966-77). Thus, the following import demand equation is specified:

WI = f(Q, C, P1 and/or P2 and/or P3, D)

The main findings are summarized below:

1) Both grain output and grain consumption show significant effects on wheat import, the former has a negative effect while the latter is positive. The magnitudes associated with those two variables are considerably high. To be more specific, one unit increase in the grain production will result in an increase of 0.114 to 0.16 units of wheat import. And one unit increase in grain consumption will lead to an increase in wheat import by 0.25 to 0.34 units.

2) Although all the price variables have the expected sign, none of them was found to be statistically significant. And the price elasticity was found to be lower than unity. The robust of domestic demand and bureaucratic style of

trade manipulation by the government were believed to be responsible for this result.

iii. Net Grain Trade Model

Due to the fact that China has been a net grain importer (GI) since 1961, net grain import relationship is of a major concern in this study. The model was specified as a function of grain output (Q), grain consumption (C), rice export price (P1) and wheat import price (P2), or the price ratio of P1 over P2, and general trade climate (D1=1 for 1966-77). The equation is expressed as:

GI = f(Q, C, P1, P2, or P1/P2)

Three major results were obtained:

1) Net grain import responds negatively to domestic grain output. The magnitude shows that one unit increase in grain output will contribute to a decrease of net import by 0.118 to 0.126 units.

2) Net grain import is positively associated with domestic grain consumption. More specifically, one unit of increase in grain consumption will result in an increase of net grain import by 0.25 to 0.28.

3) Net grain import has a significant and positive relationship with rice export price but negative one with wheat import price. That means when world market prices favor rice, more export of rice and/or less import of wheat

from/by China can be expected. The opposite is true when the price favors wheat.

Perspective of China's Grain Trade in the Future

Considerable efforts were devoted to the projection of the future development of China's grain production, domestic consumption and the grain trade in the near future. The projection of grain production were made based on individual products of rice, wheat, soybeans and other grains. The preferred production models mentioned in the preceding sections were used for this purpose. In terms of grain consumption, the projection was made for four types of domestic consumption, food, feed, seed and industrial use. The projection for the last three types of consumption were based on the empirical models built in the above sections. However, a hypothetical projection approach was adopted to predict grain consumption as food. Due to the liberalization of grain market in recent years, population growth and the level of per capita income will play critical roles in determining the domestic food consumption in the future. These changes would make the consumption models established under the circumstance of sterilized supply market less suitable for the purpose of forecasting. Combining the estimation of growth in per capita disposable income, income elasticity and the population growth, the grain consumption as food was projected for the year of 1990, 1995 and 2000. Three levels, low, medium and high, of projection were given to both production and consumption. According to the result of medium scenario, China has to

import around 30 million tons unmilled grain in order to close the gap between domestic production and consumption by the end of this century. This result is regarded as the most probable outcome compared to the low and high level scenarios.

The low scenario indicates that China will be able to export a net grain of 3.5 million tons in 1995 and 17.2 million in 2000. However, this scenario will be less likely due to several reasons. First, large population and limited arable land would make it hard to release the pressure of domestic demand for grains in the foreseeable future. Second, it is difficult and almost impossible to satisfy the assumption that population growth will increase at an annual rate of 1% which was set by the government under the low scenario. Third, the abolition of the compulsory purchasing system would make the practice of extracting grains for export by depressing domestic consumption unworkable.

The high scenario, under which the net grain import will be around 50 million tons in 1995 and about 60 million tons in 2000, was also regarded less likely due to the shortage of hard currency, constraints with port storage facilities and distribution system, as well as political sensitivity of grain import.

The general expectation for change in China's grain trade pattern is that Mainland China will increase the export of rice, reduce the import of wheat, and at the meantime, greatly increase the import of feed grain due to increases in the demand for animal products as a result of income growth. However, the practice by the Chinese government in recent years provides no supporting evidence for that. On the opposite side, China has witnessed a sharp increase in corn export during recent years and corn

in fact has become the leading product in grain exports. Several interesting reasons were given to this unexpected phenomena. First, the fast income growth in combination with higher population growth will not only greatly stimulate the demand for animal foods, but also for fine grain, which was in the past restricted by the rationing supply system and the limited availability. Second, the weakness in internal transportation and distribution system has been greatly and will continue to constraint the mobility of grain products. As a result, the distribution of imported grains will be limited to the major cities of the coastal areas. The vast rural areas in central and south China will continue to depend on fine grain as a major source of feed grain. Third, the constraint in foreign currency has been and will continue to limit the capacity of importing both food and feed grains in the future.

In summary, the authors argue that given the limitation in arable land and high population growth, the domestic production is less likely to meet the pressing demand for grains. Consequently, Mainland China will likely remain as a net grain importer in the foreseeable future, but the magnitude of grain import will be determined by the availability of foreign currency and internal distribution system. Also, due to the internal immobility of grain products, the increasing demand for meat may not lead to a sharp increase in feed grain import. As a result, rice will remain as the major substitute of feed grain in the central and southern rural areas.

II. A Review Of the Report Entitled, "The Study Of Mainland China Import And Export Of Agricultural Products", by Yi Chou, Chyan Tuan, and L. H. Lu (Chung-Hua Institution for Economic Research, Taipei, Taiwan, 1990).

The rapid agricultural development experienced in Mainland China in the 1990s has drawn wide attention from economists in both China and abroad. Due to the agricultural boom and a more open policy, both the agricultural export and import of Mainland China have achieved significant expansion during the last decade. As a result, the effect of Mainland China's agriculture on the world market has greatly strengthened and its linkage with other trade partners, both direct and indirect partners, has been enhanced. This development has also been a great concern for Taiwan, in part because Taiwan shares several of its export markets such as Japan, Hong Kong, and the U.S. with Mainland China, in part because of the increasing direct and indirect agricultural trade, as well as the increased smuggling of agricultural products from Mainland China to Taiwan, have imposed considerable effect on Taiwan's agriculture. The recent study by Chou, Tuan and Lu (1990) is a reflection of that concern.

Chou, Tuan and Lu made an attempt to explore the agricultural relationship between Taiwan and Mainland China through the comparison of their agricultural imports and exports in the world market as a whole and in three specific markets including Japan, Hong Kong and the United States. Although the study addresses a wide range of issues such as Mainland China's recent agricultural development, agricultural policy changes, growth of rural industry, circulation system of agricultural

products, and agricultural trade development, its major focus was on the comparison of agricultural performance of Taiwan and Mainland China as players in the world market as a whole and three specific markets during the period of 1984 to 1989. The following review and brief analysis focus on the issues related to agricultural trade.

A Comparison of Agricultural Trade Between Taiwan and Mainland China in the World Market

The authors pointed out that the relative importance of agriculture in the economies of both Taiwan and Mainland China has been declining since 1950s. This is reflected by the fact that the percentages of rural labor in the total labor force, agricultural share of GDP, and agricultural share of total trade value have significantly declined during the last decade. According to the example listed in the book, in 1952, 56% of the labor forces was engaged in agriculture in Taiwan, it was only 14% in 1988. Agricultural output made up 32% of GDP and 96% of total trade value in 1952 in Taiwan, both of these figures dropped to less than 10% in 1988. Mainland China has similar trends, but the share of agriculture in both GDP and total trade value remain much higher than Taiwan (the corresponding figures are 20% and 16% in 1988 in Mainland China).

According to the study, another major difference in agriculture between Taiwan and Mainland China was reflected in terms of agricultural trade surplus. Taiwan has incurred agricultural trade deficit since 1973, while Mainland China has had agricultural trade surplus for most years except very recently. In 1988, agricultural

trade produced a total trade surplus of 1.69 billion U.S. dollars for Mainland China, while Taiwan's agricultural trade suffered a total of 144.14 million U.S. dollars trade deficit in the same year. At least for the time being, these trends indicate that Mainland China has a comparative advantage in agriculture over Taiwan.

By using the standard international trade classification, a detailed comparison between Taiwan and Mainland China in the context of agricultural trade was made in the period from 1984 to 1988. A similar analysis was applied to the year of 1989, but the different data classification was used. All the agricultural goods under five categories were covered in the study. The major agricultural goods which have played a crucial role in trade can be summarized in Table A.1.

Table A.1. Agricultural Trade in Taiwan and Mainland China

Items	Area	1983	1988
Total Export Value[a]	Mainland China Taiwan	3670.1 2653.9	8129.4 4951.1
Total Import Value[a]	Mainland China Taiwan	4102.5 2888.0	6440.6 5095.3
Major Export Goods[b]	Mainland China Taiwan	05,01,29, 00,22,03 63, 03, 05 29	05,03,08,29,22,04 03, 63, 01, 05
Major Import Goods[b]	Mainland China Taiwan	04, 24, 06 04, 24, 22	04, 24, 06, 63 24, 04, 22
Major Surplus Source[b]	Mainland China Taiwan	05,01,29, 00,22,03 63, 03, 05, 61	05,03,22,29, 01,08 03, 63, 01, 05
Major Deficit Source[b]	Mainland China Taiwan	04, 24, 06 04, 24, 22, 08, 02	04, 24, 06, 63 24, 04, 22

[a]Value is measured in million U.S. dollars.

[b](1) The goods are listed in the descending order in terms of the share of total agricultural export/import value.
(2) The first number represents category (0–food and live animal chiefly for food, 1–beverage and tobacco, 2–non-edible raw material, 4–animal and vegetable oils, fats and waxes, 6–manufactured goods based on agricultural products). Second number denotes the goods under the category.
(3) 00-live animal chiefly for food, 01-meat and meat products, 03-fish, crustacean, mollusc and their products, 04-cereal and cereal products, 05-fruit and vegetable, 06-sugar, sugar products and honey, 08-feed; 22-oilseed and oil-generating fruit, 24-soft wood and timber, 29-other animal and plant material; 61-leather, leather product and hides, 63-products of soft wood and timber.

Source : Chou et al. (1990).

Several conclusions can be drawn from Table A.1:

1) Category 0 is the major source of export for both Taiwan and Mainland China during the period of 1983-1988. Category 2 is another source of export for Mainland China while category 6 is a unique source of export for Taiwan. In the context of Mainland China, six types of goods, including 05 (fruit and vegetable), 01 (meat and meat products), 29 (other animal and plant material), 00 (live animal chiefly for food), 22 (oilseed and oil-generating fruits) and 03 (fish, crustacean, mollusc and their products) in 1983, and 05, 03, 08(feed), 29, 22 and 04 (cereal and cereal products) in 1988, contributed more than 60% of its total exports. In Taiwan, agricultural exports concentrated on four types of goods. In 1983, the categories of 63 (manufactured goods based on soft wood and timber), 03, 05 and 29 in combination made up 78.1% of its total exports, while in 1988 the categories of 03, 63, 01 and 05 amounted to 77% of the total.
2) In the context of imports, the categories of 0 and 2 are the major sources for both Mainland China and Taiwan. The categories of 04 (cereal and cereal products), 24 (soft wood and timber) and 06 (sugar, sugar products and honey) generated up to 85% of total imports in Mainland China during the period of 1983 to 1988, while in Taiwan, up to 60% of the imports was from the categories of 04, 24 and 22 during the same period.
3) With respect to trade surplus and deficit, the categories of 05 (fruits and vegetables) and 03 (aquatic products) share equal importance in generating trade surplus in both Mainland China and Taiwan, which are considered as

"competitive goods" by the authors. Although less importantly, the category of 01 (live animals) was another competitive good between Mainland and Taiwan. As shown in Table A.1, the categories of 29 (other animals) and 22 (oil seeds) had been other major sources of trade surplus for Mainland China but they created a trade deficit for Taiwan. Similarly, the category of 63 was a major source of trade surplus for Taiwan but played the opposite role in Mainland China's agricultural trade. These three goods are considered as "substitute goods", which are the important basis for trade. Other main substitute goods include 08, 00 and 61 in which the former two categories created a surplus and the last one generated a deficit for Mainland China during the period of 1983-1988. The opposite is true for Taiwan. Two goods including 04 (cereal products) and 24 (soft wood and timer) were the major sources of trade deficit for both Taiwan and Mainland China, which are viewed as "irrelevant goods". The category 06 (sugar) has been another major source of trade deficit for Mainland China and it belonged to a substitute good until 1986. It turned into irrelevant goods since 1987 when the net export of the goods in 06 in Taiwan also became negative.

Relative Performance of Mainland China and Taiwan in the Markets of Japan, Hong Kong and the United States

The study pointed out that Japan has been the No. 1 market for Taiwanese agricultural exports, while United States and Hong Kong have served as major markets

for both its agricultural imports and exports. For Mainland China, Hong Kong, Japan and former Soviet Union are the three largest markets for export, while the U.S. and Canada have been the important suppliers of its agricultural imports. A comprehensive comparison between Taiwan and Mainland China regarding the agricultural performance in the markets of Japan, Hong Kong and U.S. from 1984 to 1989 was made in this study. The major conclusions are summarized and derived as follows.

1) At least until 1988, the total agricultural exports from Taiwan to Japan and U.S. have been greater than that from Mainland China. For example, Taiwan exported 1.4 times as much agricultural goods to Japan as Mainland did in 1988. The corresponding figure in the U.S. market was 2.8, though the agricultural exports to the U.S. from Mainland China had remain at a higher growth rate than Taiwan. However, Mainland China's agricultural exports took a much greater share of Hong Kong market than Taiwan. The former was 8.3 times larger than the latter in 1988. Except for the category 61, the relative shares of most of other agricultural goods exported to Hong Kong from Taiwan had dropped between 1984 and 1988. These trends may indicate that Taiwan's agricultural products had become less competitive than that of Mainland China.

2) Both Taiwan and Mainland China enjoyed a trade surplus in agriculture with Japan and Hong Kong during 1984-1988. While in the U.S. market, both of them had a trade deficit. Despite that Taiwan exported nearly three times as much agricultural goods to U.S. as Mainland China, the

magnitude of trade deficit in Taiwan was only marginally less than that of Mainland China due to its much larger agricultural imports from the U.S.

Table A.2. A Comparison of Agricultural Trade Between Taiwan and Mainland China in the Markets of Japan, Hong Kong and U.S.

Items		Japan	Hong Kong	U.S.
Total Export Value [a] (1988)	Mainland Taiwan	1862.0 2591.2	2364.0 286.4	380.9 1057.4
Total Import Value [a] (1988)	Mainland Taiwan	67.1 394.4	301.3 182.8	1645.9 2241.3
Major Export Goods [b] (1984)	Mainland Taiwan	05,22,03,29,04 03,05,01,29,63	00,05,01,29 05, 63, 61	05,07,29 63,05,03,61
Major Export Goods [b] (1988)	Mainland Taiwan	05,03,04,29,08 03,01,05,63,29	05,00,03,29 61, 63, 05	03,05,29 63, 03, 61
Major Import Goods [b] (1984)	Mainland Taiwan	04	12,08,63 29, 03	04, 24 04, 22
Major Import Goods [b] (1988)	Mainland Taiwan	08 08, 21, 29	61, 12 29, 03	04, 24, 12 04, 22, 12
Export/ Import Ratio (1984)	Mainland Taiwan	26.2 5.0	19.0 1.23	0.1 0.5
Export/ Import Ratio (1988)	Mainland Taiwan	27.8 6.6	7.8 1.53	0.23 0.47

[a]Value is measured in million U.S. dollars
[b]The definitions of good categories are provided in Table A.1 except the category 12 is tobacco.

3) As showed in Table A.2, the export/import ratios of Mainland China in Japan and Hong Kong are extremely high, indicating that agricultural imports from Japan and Hong Kong are relatively insignificant compared with the exports. In 1988, Mainland China remained in surplus in all agricultural goods traded with Japan, while in the Hong Kong market, only three goods, i.e., 61, 12, 41 exhibited a deficit. Comparing with Mainland China, the export/import ratio of Taiwan in these two markets are much smaller. In fact, the agricultural exports to Hong Kong from Taiwan was only marginally higher than the agricultural imports during 1984 and 1988. In the Japanese market, Taiwan has ten good categories with a deficit including 00, 02, 04, 08, 12, 21, 42 and 61 in 1988, though 82% of these deficits were generated by three types of goods, namely, 08, 21 and 61.

4) The situation of agricultural exports and imports in the U.S. market is a little different, in which the export/import ratio for both Taiwan and Mainland China are less than one. This reflects that the U.S. market is of more importance for Taiwan and Mainland China's agricultural imports than their exports. It also indicates that the U.S. has an overall comparative advantage in agriculture than both Taiwan and Mainland China. In the case of Mainland China, 90% of the imports came from three sources, 04, 24 and 12. For Taiwan, agricultural imports from the

U.S. concentrated on the categories of 04, 22 and 12, which in combination made up 62.6% of the total agricultural imports in 1988.

5) Mainland China showed comparative advantages in the goods of 03, 05 and 29 in all the three markets. In the case of Taiwan, the comparative advantage in these three goods are only confined to the Japanese market, while in the Hong Kong market the category of 03 in fact was a source of trade deficit. Taiwan lost its advantage to the U.S. in the category of goods 05 (fruits and vegetables) in 1988. However, Taiwan exhibited a unique advantage in the category of goods 63 (softwood and timber) in all the three markets.

6) It is worth mentioning that the relative importance of goods 03 (aquatic products) in Mainland China's agricultural exports has been increasing in all three markets. But this market share was only 50% of that of Taiwan in the U.S. market and 40 percent of that in Japan market. In the case of Taiwan, the goods 61 (leather products) have been in its upswing in exports since 1984.

Effect of Agricultural Goods Smuggling on Taiwan Agriculture

Despite increasing efforts devoted by the Taiwan government to curtail the smuggling of agricultural goods to Taiwan, few indications show that the smuggling will be stopped from spreading. The total value of agricultural goods transferred to Taiwan

through this channel was estimated to be over 200 million Taiwanese dollars. Huge profits generated in smuggling and encouragement by Mainland Chinese government were believed by the authors as two important factors that stimulate this activity.

A wide variety of agricultural goods, including peanut, red bean, mushroom, garlic, meat and meat products, fruits, etc, were reported to be smuggled to Taiwan from Mainland China. The lower price of the smuggled goods made the local production of these same kinds of goods less profitable. As a result, both the acreage and quantity of some products, including peanut, black melon seeds, mushroom, garlic, etc. have declined in Taiwan.

Adjusting the agricultural structure and improving the environments for agricultural development to make the Taiwanese agricultural products more competitive were suggested by the authors as two further measures to reduce the smuggling. The authors also believe that there are good prospects for cooperation between Taiwan and Mainland China. This was justified by the fact that Taiwan has comparative advantages in agricultural technology while Mainland China enjoys the advantage of having a large market and low cost of land and labor force.

The increasing smuggling activities of agricultural goods from Mainland China to Taiwan have been perceived as a strong signal that Mainland China, at least for the time being, has comparative advantages on those goods. Making a full use of these advantages will benefit both Mainland China and Taiwan so claimed by the authors. The past practice in Taiwan has proved that fighting smuggling is not only extremely costly, but less effective. The best way to eliminate smuggling according to the authors,

is to open up the market. It should be noted that a large part of the benefit from the smuggling was exploited by the smugglers, while opening the market will avoid this problem and benefit consumers the most.

Appendix B

Agricultural Exports, Imports, Production and Prices in Mainland China

Annual Data During the Reform Period: 1978-1992

I. Definition of Variables:

HOG = hogs
PORK = pork
AQP = Aquatic products
CEREAL = cereals
BEAN = soybeans
PEANUT = peanut
VE = vegetables
FRUIT = fruits
TEA = tea
COTTON = cotton
COY = cotton yarn
COC = cotton cloth
Grain = cereals and soybeans
RICE = rice
WHEAT = wheat
RS = raw silk
SUGAR = sugar
OIL = edible oils
PETI = chemical fertilizer
PEST = pesticides

II. Indexes:

01 = Export volume (quantity)
02 = Export value
03 = Quantity of production
04 = Sow area of crops
05 = Import volume (quantity)
06 = Import value

III. Units of Measurements

mil. dols = million dollars
t thous tn = ten thousand tons
mil. mu = million mu

Available Data for Estimating Export Supply and Import Demand Elasticities

VARIABLE	ITEMS	SAMPLE PERIOD
Export price	hog, pork, grain, rice, corn, soybean, fruit, sugar, peanut, canned vegetable, tea, cotton, aquatic products, cotton cloth	1980-1992
Export quantity	hog, pork, grain, rice, corn, soybean, fruit, sugar, peanut, canned vegetable, tea, cotton, aquatic products, cotton cloth	1980-1992
Mixed average retailed price	pork, beef, grain, edible oil, vegetable, tea, sugar, cotton cloth, aquatic products	1952-1992
Consumption - national	grain, edible oil, pork, sugar	1952-1992
Urban consumption (per capita)	grain, edible oil, pork, beef, poultry, vegetable, seafood, sugar, cotton cloth	1982-1992
Rural consumption (per capita)	grain, fine grain, edible oil, red meat, poultry, seafood, sugar, cotton cloth	1978-19992
Import price	grain, wheat, sugar, cotton, edible oil, logs, fertilizer	1980-1992
Import quantity	grain, wheat, sugar, cotton, edible oil, logs, fertilizer	1980-1992

Table 1: Quantity and Value of Major Agricultural Exports
Mainland China (1978-1992)

YEAR	HOG01	HOG02	PORK01	PORK02	AQP01	AQP02
	10,000 head	*mil. dols*	*10,000 ton*	*mil. dols*	*10,000 ton*	*mil. dols*
1978						
1979						
1980	316	233.5	6.1	111.6	11.2	365
1981	318	252.6	7.1	112	11.5	359.1
1982	324	251.6	10.1	205.1	10.3	315.2
1983	321	229.9	9.8	175.3	10.5	278.4
1984	308	213.7	10	163.4	11.6	305.2
1985	296	179.4	11.1	160.5	12.3	274.7
1986	310	194.9	10.5	175	16.7	478.3
1987	302	202	10	172.1	21.8	702.6
1988	303	232.9	6.3	115.8	28.7	932.8
1989	297	240	8.8	160	29.4	990
1990	300	270	12	220	36	1320
1991	285	280	12	190	38	1180
1992	290	290	5	80	44	1370

Notes: The index 01 refers to the quantity of exports, while 02 denotes the value of exports.
mil. dols=million dollars, AQP=aquatic products.

Table 1: Quantity and Value of Major Agricultural Exports Mainland China (1978-1992)

YEAR	GRAIN01 *10,000 ton*	GRAIN02 *mil. dols*	BEAN01 *10,000 ton*	BEAN02 *mil. dols*	PEANUT01 *10,000 ton*	PEANUT02 *mil. dols*
1978						
1979						
1980	138	460.5	10	34.5	7.7	66.4
1981	99	376.1	13.8	51.6	26.3	336.1
1982	81	286	14.9	42.8	12.5	101.3
1983	115	313.6	34.8	90	15.6	116.6
1984	319	719.5	83.6	252.9	14.3	135.6
1985	932	1362.1	113.6	267.9	16.3	111
1986	942	1611.7	137	300.2	26.2	157.3
1987	737	1013.6	171	367.5	26.8	182.9
1988	718	1189	148	381	25.1	170.2
1989	656	1190	125	313.8	26.6	190
1990	583	1020	94	230	38	270
1991	1086	1581.4	111	260	43	360
1992	1364	1995.8	66	160	30	190

Notes: The index 01 refers to the quantity of exports, while 02 denotes the value of exports. mil. dols=million dollars, grain includes rice, corn, soybean and other grain products.

Table 1: Quantity and Value of Major Agricultural Exports Mainland China (1978-1992)

YEAR	VE01 *10,000 ton*	VE02 *mil. dols*	FRUIT01 *10,000 ton*	FRUIT02 *mil. dols*	TEA01 *10,000 ton*	TEA01 *mil. dols*
1978						
1979						
1980	34.4	144.3	24.2	94.1	10.1	241.3
1981	47.1	218.8	19.9	76.6	9	200.7
1982	50.6	224.3	20.8	73	10.6	224.8
1983	54	237.1	19.6	73.6	12.5	233.4
1984	52.2	226.4	17.4	64	14.5	309.9
1985	51.2	225.7	21.4	79	13.7	294.1
1986	64.4	273.5	22.4	86.3	17.2	327.4
1987	64.2	339.3	24.4	101.4	17.4	262.5
1988	76.6	476.1	29.8	125.7	19.8	402
1989	82.1	520	25.2	110	20.5	420
1990	98	590	22.6	102.9	19.6	410
1991	104	660	16	75.5	18.5	380
1992	138	830			17.6	360

Notes: The index 01 refers to the quantity of exports, while 02 denotes the value of exports. mil. dols=million dollars, ve=vegetable.

Table 1: Quantity and Value of Major Agricultural Exports Mainland China (1978-1992)

YEAR	COTTON01 *10,000 ton*	COTTON02 *mil. dols*	COY01 *10,000 ton*	COY02 *mil. dols*	COC01 *t thous tn*	COC02 *mil. dols*
1978						
1979						
1980			4.4	128.7	1582.3	725.8
1981	1	2.6	4.8	122.5	1277.7	803.6
1982	0.38	6.4	4.9	118.6	1179	717.5
1983	5.8	74	11.4	298.9	1371.4	776.5
1984	18.9	276.1	16.7	386.2	1732.6	1115.4
1985	34.7	433.1	15.5	294.4	1673.4	994.3
1986	55.8	525.4	22.8	424.5	2056.3	1269.7
1987	75.5	756.1	24.3	535.1	2341.5	1525.3
1988	46.8	718.9	20.6	511.8	2229.4	1487.8
1989	27.3	430	18.4	420	2238.3	1600
1990	16.73	300.5	17.62	390	2221.6	1600
1991	20	361	18.7	460	2372.1	1740
1992	14.46	210	16.29	390	3023.13	2060

Notes: The index 01 refers to the quantity of exports, while 02 denotes the value of exports. mil. dols=million dollars, coy=cotton yard, coc=cotton cloth.

Table 2: Production of Major Agricultural Products
Mainland China (1978-1992)

YEAR	GRAIN03	RICE03	WHEAT03	PEANUT03	BEAN03	RS03
	10,000 ton	*10,000 ton*	*10,000 ton*	*10,000 ton*	*10,000 ton*	*10,000 ton*
1978	30477	13693	5384	237.7	757	17.3
1979	33212	14375	6173	282.2	746	21.3
1980	32056	13991	5521	360	794	25
1981	32502	14396	5964	382.6	933	25.2
1982	35450	16160	6847	391.6	903	27.1
1983	38728	16887	8139	395.1	976	26.8
1984	40731	17826	8782	481.5	970	30.6
1985	37911	16857	8581	666.4	1050	33.6
1986	39151	17222	9004	588.2	1161	33.6
1987	40298	17426	8590	617.1	1247	35.4
1988	39408	16911	8543	569.3	1165	39.4
1989	40755	18013	9081	536.3	1023	43.5
1990	44624	18933	9823	636.8	1100	48
1991	43529	18381	9595	630.3	971	58.4
1992	44266	18622	10159	595.3	1030	66

Notes: The index 03 refers to the quantity of agricultural products.

Table 2: Production of Major Agricultural Products
Mainland China (1978-1992)

YEAR	HOG03 *mil. head*	PORK03 *10,000 ton*	AQP03 *10,000 ton*	FRUIT03 *10,000 ton*	COTTON03 *10,000 ton*	TEA03 *10,000 ton*
1978	301.3		466	657	216.7	26.8
1979	319.7		431	701.5	220.7	27.7
1980	305.4	1134	450	679.3	270.7	30.4
1981	293.7	1188.5	461	780.1	296.8	34.3
1982	300.8	1271.8	516	771.3	359.8	39.7
1983	298.5	1316.1	546	948.7	463.7	40.1
1984	306.8	1444.7	619	984.5	625.8	41.4
1985	331.4	1654.7	705	1163.9	414.7	43.2
1986	337.2	1796	824	1347.7	354	46.1
1987	327.7	1834.9	955	1667.8	424.5	50.9
1988	342.2	2017.6	1061	1666.1	414.9	54.5
1989	352.8	2122.8	1152	1831.9	378.8	53.5
1990	362.4	2281.1	1237	1974.4	450.8	54
1991	369.7	2452.3	1351	2176.1	567.5	54.2
1992	384.2	2635.3	1557	2440.1	450.8	56

Notes: The index 03 refers to the quantity of agricultural products.
mil. head=million heads, AQP=aquatic products.

Table 3: Acreage of Major Agricultural Products, Mainland China(1978-1992).

YEAR	GRAIN04 *mil. mu*	RICE04 *mil. mu*	WHEAT04 *mil. mu*	BEAN04 *mil. mu*	COTTON04 *mil. mu*	PEANUT04 *mil. mu*	FRUIT04 *mil. mu*	TEA04 *mil. mu*
1978	1808.8	516.3	437.7	107.2	73	26.5	24.9	15.7
1979	1788.9	508.1	440.4	108.7	67.7	31.1	26.3	15.8
1980	1758.5	508.2	438.1	108.4	73.8	35.1	26.7	15.6
1981	1724.4	499.4	421.6	120.4	77.8	37.1	26.9	15.9
1982	1701.9	496.1	419.3	126.3	87.4	36.2	29.3	16.5
1983	1710.7	497.1	435.8	113.5	91.2	33	30.2	16.6
1984	1693.3	497.7	443.7	109.3	104.9	36.3	33.2	16.2
1985	1632.7	484.1	438.3	115.8	77.1	49.8	41.4	15.7
1986	1664	484	444.2	124.4	64.6	48.8	55.1	15.4
1987	1669	482.9	431.9	126.7	71.7	45.3	67.6	15.7
1988	1651.8	479.8	431.8	121.8	83	44.7	76	15.8
1989	1683.1	490.5	447.6	120.9	78.1	44.2	80.6	16
1990	1702	496	461.3	113.4	83.8	43.6	77.7	16
1991	1684.7	488.9	461.2	105.6	98.1	43.2	79.8	15.9
1992	1658.4	481.5	457.5	108.3	102.6	44.6	87.3	16.3

Notes. The index 04 refers to the acreage of crops. mil. mu=million mu.

Table 4: Quantity and Value of Major Agricultural Imports Mainland China (1978-1992)

YEAR	GRAIN05 *10,000 ton*	GRAIN06 *mil. dols*	SUGAR05 *10,000 ton*	SUGAR06 *mil. dols*	COTTON05 *10,000 ton*	COTTON06 *mil dols*
1978						
1979						
1980	1287	2480.3	85	316.1	88.5	1463.7
1981	1448	3234.3	99	445.4	80.1	1534.3
1982	1615	3407	216	657.3	47.3	724.3
1983	1353	2477	183	440.7	23	331.3
1984	1041	1831.7	123	259.5	4	79.6
1985	600	997.1	191	272.9	0.02	0.13
1986	773	1082.4	118	211.5	0.02	0.15
1987	1628	1754	183	297.4	0.6	12.8
1988	1533	1895.5	381	858.2	3.5	58.9
1989	1658	2990	158	430	51.9	708.7
1990	1372	2350	113	380	41.6	710.8
1991	1345	1640	101	260	37.1	630.7
1992	1175	1752	110	260	28	429.5

Notes: The index 05 refers to the quantity of imports, while 06 denotes the value of imports.
mil. dols=million dollars.

Table 4: Quantity and Value of Major Agricultural Imports, China Mainland China (1978-1992)

YEAR	OIL05 *10,000 ton*	OIL06 *mil dols*	FETI05 *10,000 ton*	FETI06 *mil. dols*	PEST05 *10,000 ton*	PEST06 *mil. dols*
1978						
1979						
1980	9.2	155.1	544	1128.1	1.3	33.8
1981	4.4	27.2	555	1284	1.7	53.2
1982	5.6	29.2	606	1252.3	1.6	59.2
1983	3.5	24.6	800	1398.3	6.1	215.1
1984	1.4	8.6	923	1666	5.9	247.6
1985	3.5	22	761	1504.7	1.6	103.2
1986	19.8	83.5	510	712.1	0.7	40.7
1987	51.1	186	1090	1399.2	1	55.8
1988	21.3	94.8	1471	2335.5	3.4	156.3
1989	14.4	90	1393	2360	3.7	200
1990	231	950	1626	2600	2.8	180
1991	170	690	1818	3230	3.2	190
1992	107	450	1859	3000	3.9	200

Notes: The index 05 refers to the quantity of imports, while 06 denotes the value of imports. mil. dols=million dollars. FETI=chemical fertilizers, PEST=pesticides.

Table 5: Prices of Major Agricultural Products, Mainland China(1978-1992)

YEAR	Pork	grain	AQP	VEG	Soybean	Sugar	Rice, milled	Wheat
	Pd1	Pd1	Pd1	Pd1	Pd1	Pd1	Pd1	Pd1
1978	964.60	175.10	566.05	62.37		861.25		
1979	1142.12	192.03	706.11	71.19	365.27	933.76	221.86	190 35
1980	1349.44	205.22	842.90	81.42	391.75	985.72	238.25	203.55
1981	1236.73	197.77	791.43	78.62	357.88	875.33	217.66	184.80
1982	1120.21	179.82	735.54	73.98	323.38	775.69	196.57	165.92
1983	1106.44	177.86	791 62	78.96	309.26	755.18	188.29	158 42
1984	983.62	154.53	800.43	76.72	262.93	654.74	159.91	133.62
1985	936.08	130.52	893.83	87.51	230.19	520.11	139.95	116.80
1986	875.23	119.76	848.12	81.96	214.03	435.99	130.33	108.03
1987	940.60	118.75	964.78	102.63	227.83	413.10	137.29	110.15
1988	1331.51	131.48	1414.42	129.23	265.17	617.07	161.20	121 44
1989	1434.76	147.94	1598.68	134.39	371.57	677.19	207.17	145.02
1990	1107 63	110.41	1154.85	111.01	300.43	553.60	150.74	111.64
1991	1003.01	118.65	1184 69	115.16	271.28	556.19	145.22	110.46
1992	1046.06	151.86	1159.31	139.08	325.48	458.20	174.25	131 82

Notes: Pd1 is the domestic retail price converted into U.S. currency(dollars/ton).

Table 5: Prices of Major Agricultural Products, Mainland China(1978-1992)

YEAR	Grain	Wheat	Sugar Crops	Fruit	Soybean
	Pp1	Pp1	Pp1	Pd	Pd
1978	156.45		25.11	205.10	
1979	212.67	216.08	34.81	209.60	
1980	240.66	241.59	39.39	220.10	0.67
1981	223.94	223.53	36.52	223.80	1.04
1982	207.24	208.72	31.10	228.50	1.06
1983	198.71	220.68	31.22	247.50	1.15
1984	170.30	188.79	28.06	292.80	1.13
1985	141.69	149.49	24.56	384.40	1.06
1986	134.93	132.65	22.56	415.20	1.20
1987	136.62	127.08	22.88	453.40	1.15
1988	151.45	147.23	29.05	632.90	1.06
1989	199.20	179.01	35.29	570.90	1.11
1990	149.69	131.71	29.60	556.60	1.07
1991	127.24	115.54	27.72	594.50	1.04
1992	128.01	122.76	25.49	551.70	1.18

Notes: Pp1 is the domestic procurement price converted into U.S. currency(dollars/ton).
Pd is the domestic retail price index.

Table 5: Prices of Major Agricultural Products, Mainland China(1978-1992)

YEAR	Pork	Grain	AQP	VEG	Soybean	Sugar	Rice,milled	Wheat
	Pd0	Pd0	Pd0	Pd0	Pd0	Pd0	Pd0	Pd0
1978	1624.0	294.8	953.00	105.00		1450.00		
1979	1776.0	298.6	1098.00	110.70	568.00	1452.00	345.00	296.00
1980	2022.0	307.5	1263.00	122.00	587.00	1477.00	357.00	305.00
1981	2108.0	337.1	1349.00	134.00	610.00	1492.00	371.00	315.00
1982	2120.0	340.3	1392.00	140.00	612.00	1468.00	372.00	314.00
1983	2186.0	351.4	1564.00	156.00	611.00	1492.00	372.00	313.00
1984	2282.0	358.5	1857.00	178.00	610.00	1519.00	371.00	310.00
1985	2749.0	383.3	2624.90	257.00	676.00	1527.40	411.00	343.00
1986	3022.0	413.5	2928.40	283.00	739.00	1505.40	450.00	373.00
1987	3501.0	442.0	3591.00	382.00	848.00	1537.60	511.00	410.00
1988	4956.0	489.4	5264.60	481.00	987.00	2296.80	600.00	452.00
1989	5402.0	557.0	6019.20	506.00	1399.00	2549.70	780.00	546.00
1990	5298.0	528.1	5523.90	531.00	1437.00	2648.00	721.00	534.00
1991	5339.0	631.6	6306.10	613.00	1444.00	2960.60	773.00	588.00
1992	5769.0	837.5	6393.60	767.00	1795.00	2527.00	961.00	727.00

Notes: Pd0 is the domestic retail price in domestic currency (yuan/ton).

Table 5: Prices of Major Agricultural Products, Mainland China(1978-1992)

YEAR	Grain	Wheat	Sugarcane	Sugarbeet	Sugar Crops
	Pp0	Pp0	Pp0	Pp0	Pp0
1978	263.40		36.20	60.50	42.28
1979	330.70	336.00	44.90	81.80	54.13
1980	360.60	362.00	50.30	85.20	59.03
1981	381.70	381.00	54.00	87.00	62.25
1982	392.20	395.00	50.00	85.40	58.85
1983	392.60	436.00	53.40	86.50	61.68
1984	395.10	438.00	60.60	78.60	65.10
1985	416.10	439.00	66.60	88.70	72.13
1986	465.90	458.00	74.10	89.30	77.90
1987	508.50	473.00	77.50	108.20	85.18
1988	563.70	548.00	103.80	121.10	108.13
1989	750.00	674.00	131.10	138.20	132.88
1990	716.00	630.00	135.20	160.80	141.60
1991	677.30	615.00	141.70	165.20	147.58
1992	706.00	677.00	136.60	152.60	140.60

Notes: Pp0 is the domestic procuremnet price in domestic currency (yuan/ton).
The price for sugar crops is an weighted average of sugarcane and sugarbeet.

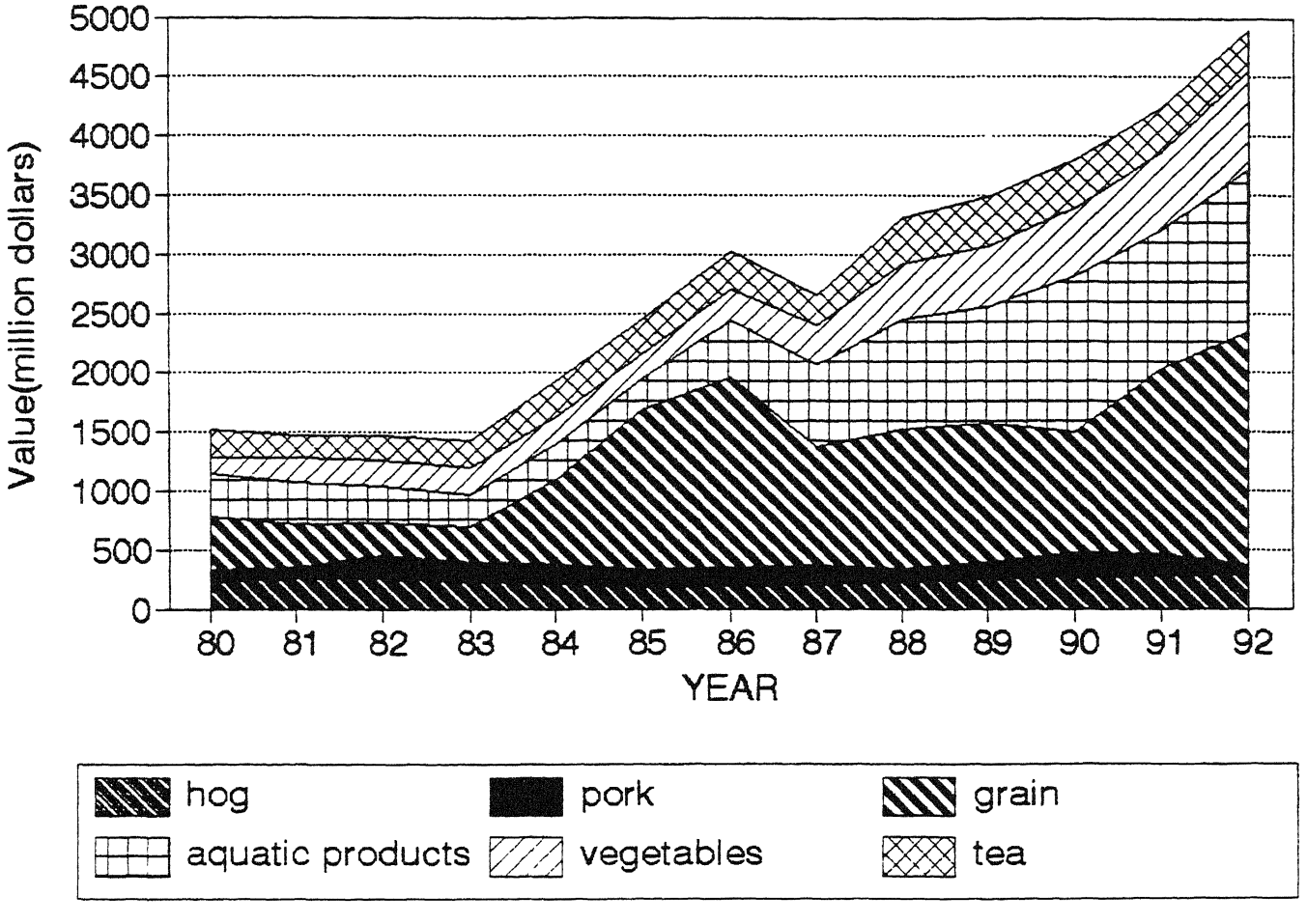
Table 6: Per Capita Consumption of Major Agricultural Products, Mainland China(1978-1992)

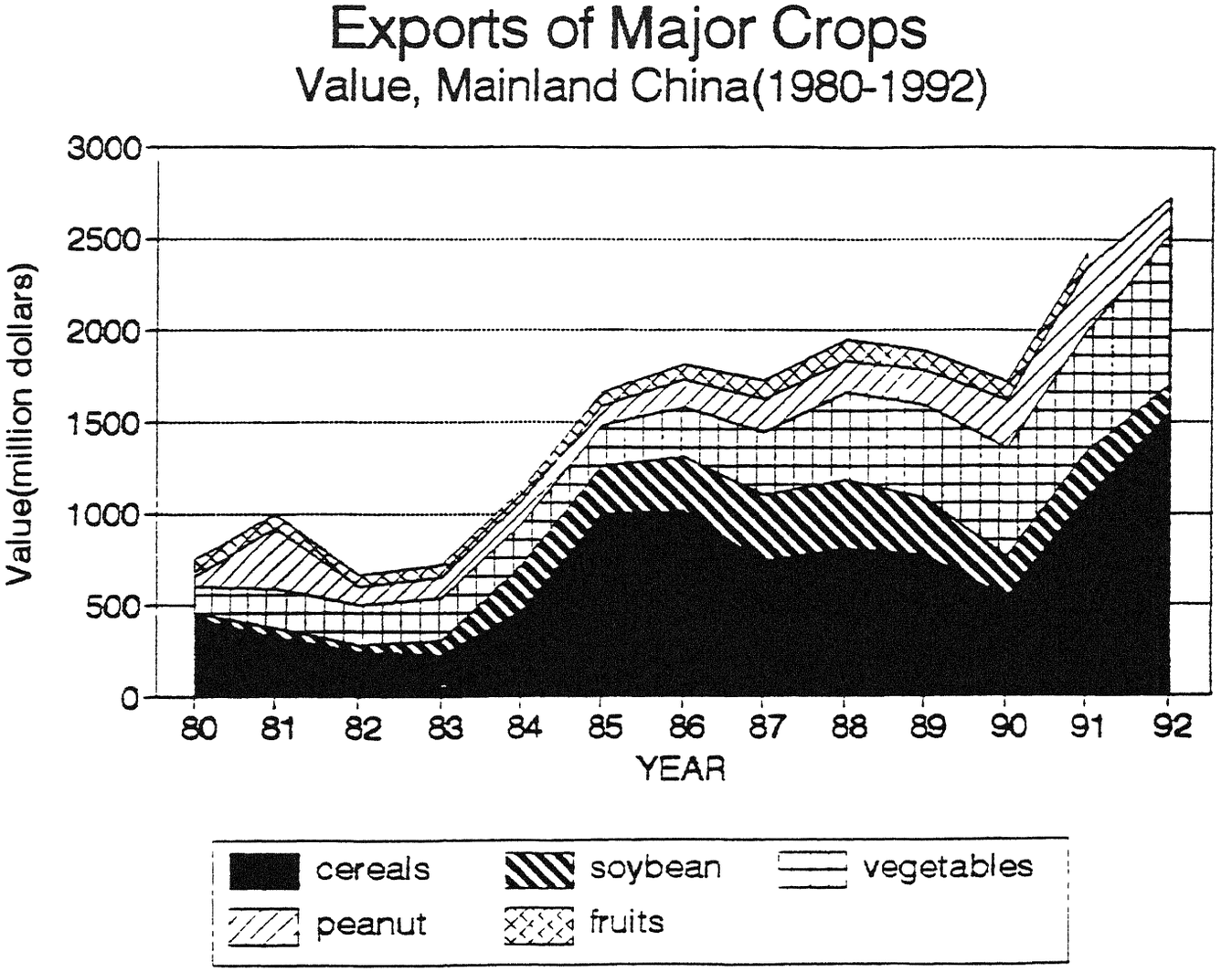
Year	Per Capita Consumption (Kg/per capita)			
	Grain	Pork	Sugar	AQP
1978	195.46	7.67	3.42	3.5
1979	207.03	9.66	3.56	3.22
1980	213.81	11.16	3.83	3.41
1981	219.18	11.08	4.10	3.57
1982	225.46	11.76	4.42	3.85
1983	232.23	12.35	4.47	4
1984	251.34	13.02	4.88	4.32
1985	254.35	13.99	5.63	4.84
1986	255.94	14.41	6.12	5.33
1987	251.44	14.54	6.66	5.49
1988	249.08	14.91	6.25	5.66
1989	239.12	15.36	4.92	6.17
1990	238.80	16.64	4.98	6.53
1991	234.50	17.40	5.00	6.79
1992	233.20	17.70	5.20	7.29

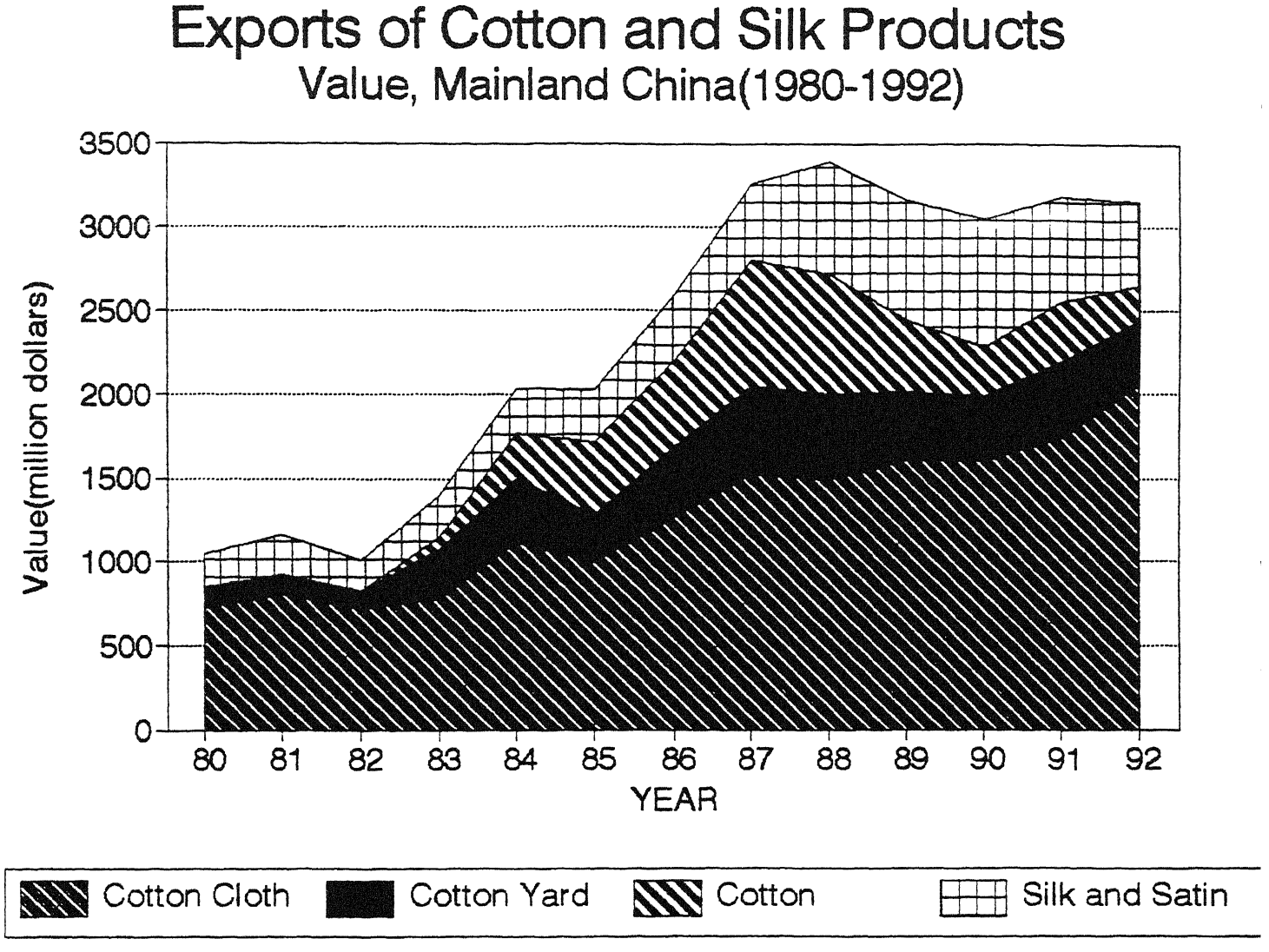
Notes: AQP refers to Aquatic Products.

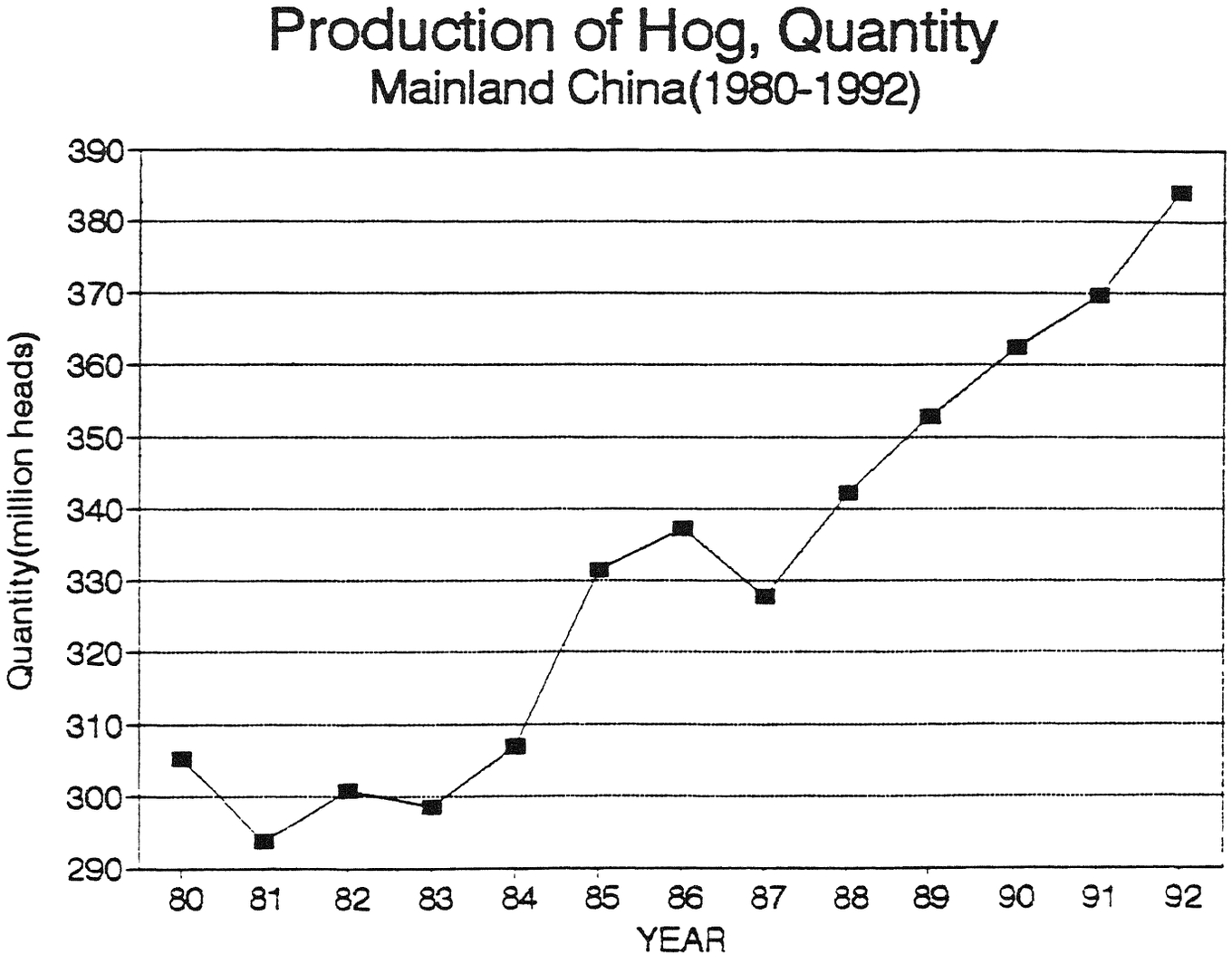
Exports of Major Agricultural Goods

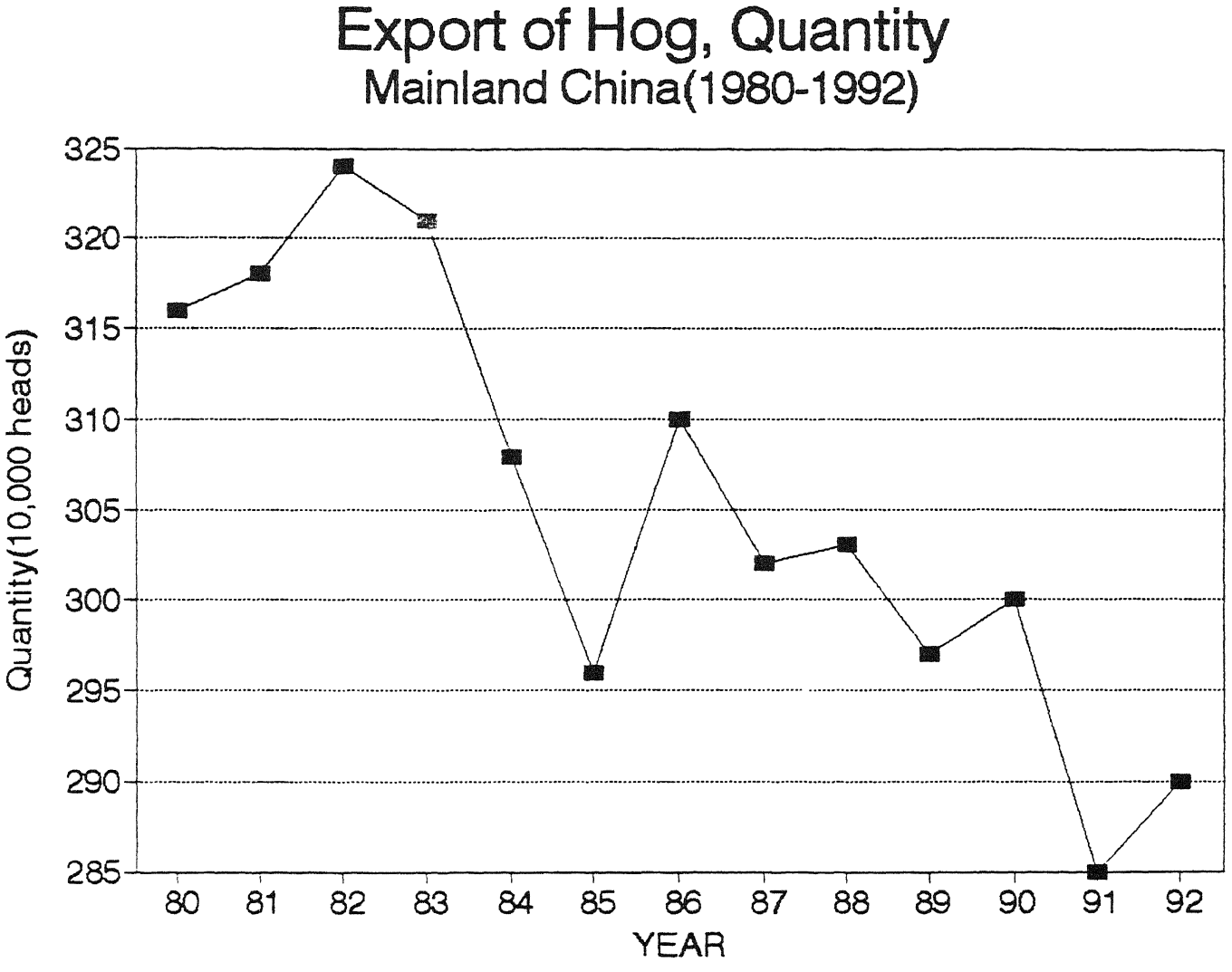
Value, Mainland China(1980-1992)



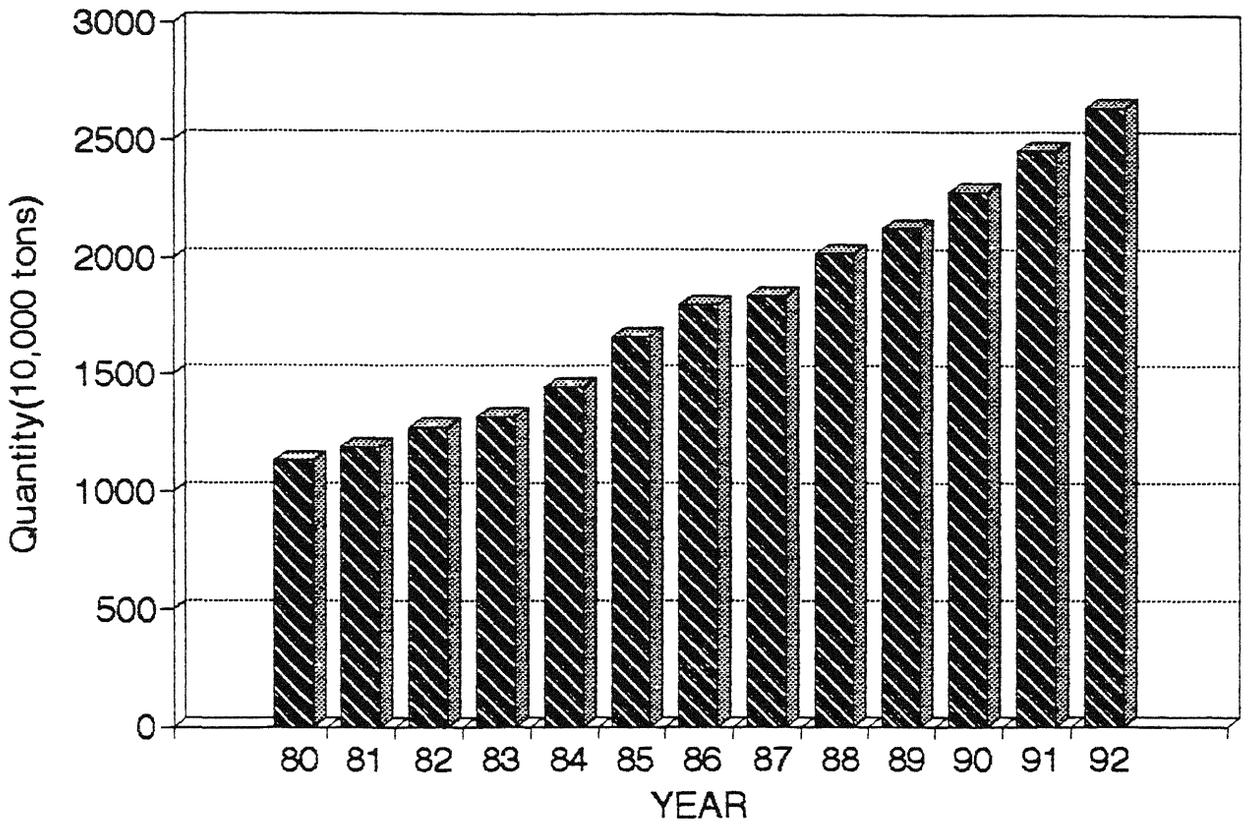

Exports of Major Crops
Value, Mainland China(1980-1992)
Value(million dollars)
3000
2500
2000
1500
1000
500
0
80
81
82
83
84
85
86
87
88
89
90
91
92
YEAR
cereals
soybean
vegetables
peanut
fruits


Exports of Cotton and Silk Products
Value, Mainland China(1980-1992)
Value(million dollars)
3500
3000
2500
2000
1500
1000
500
0
80
81
82
83
84
85
86
87
88
89
90
91
92
YEAR
Cotton Cloth
Cotton Yard
Cotton
Silk and Satin

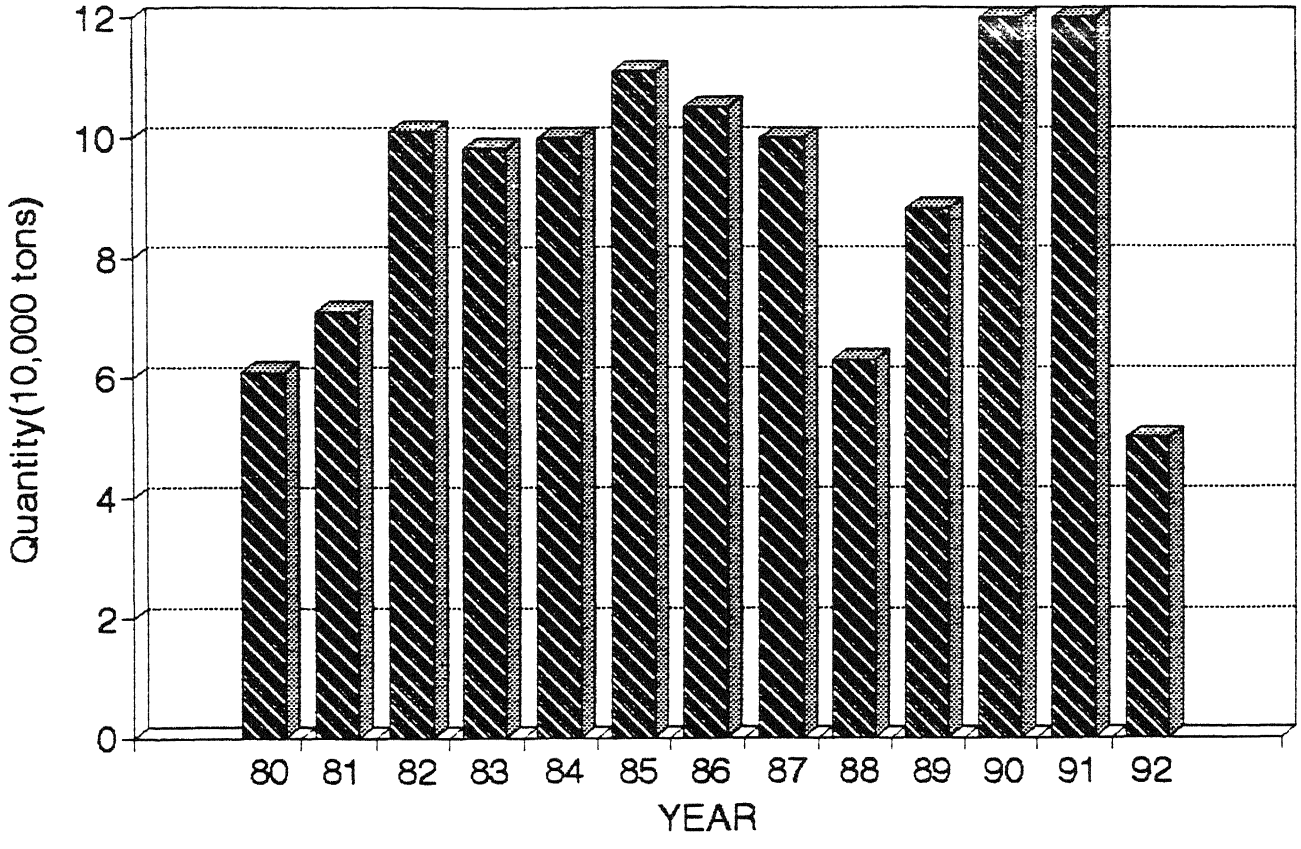

Production of Hog, Quantity
Mainland China(1980-1992)
Quantity(million heads)
390
380
370
360
350
340
330
320
310
300
290
80
81
82
83
84
85
86
87
88
89
90
91
92
YEAR


Export of Hog, Quantity
Mainland China(1980-1992)
Quantity(10,000 heads)
325
320
315
310
305
300
295
290
285
80
81
82
83
84
85
86
87
88
89
90
91
92
YEAR

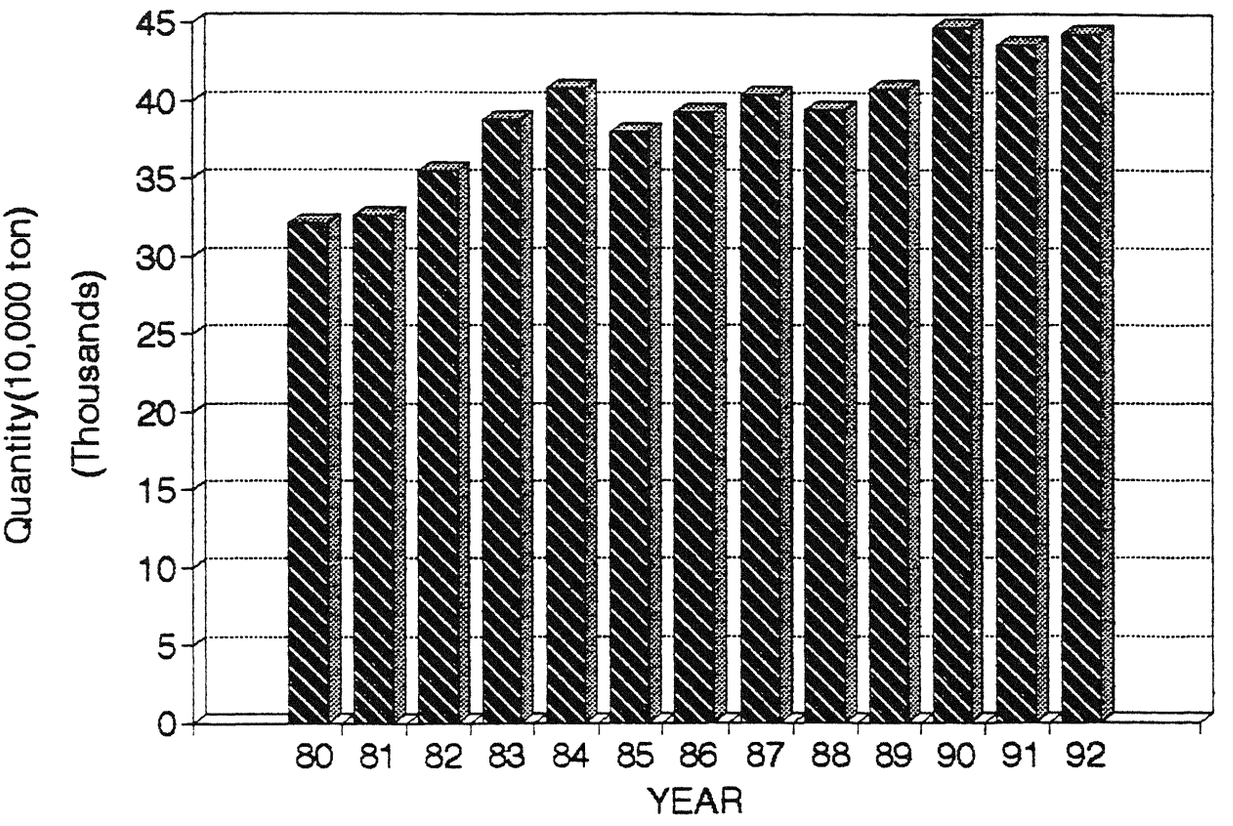
Production of Pork, Quantity
Mainland China(1980-1992)



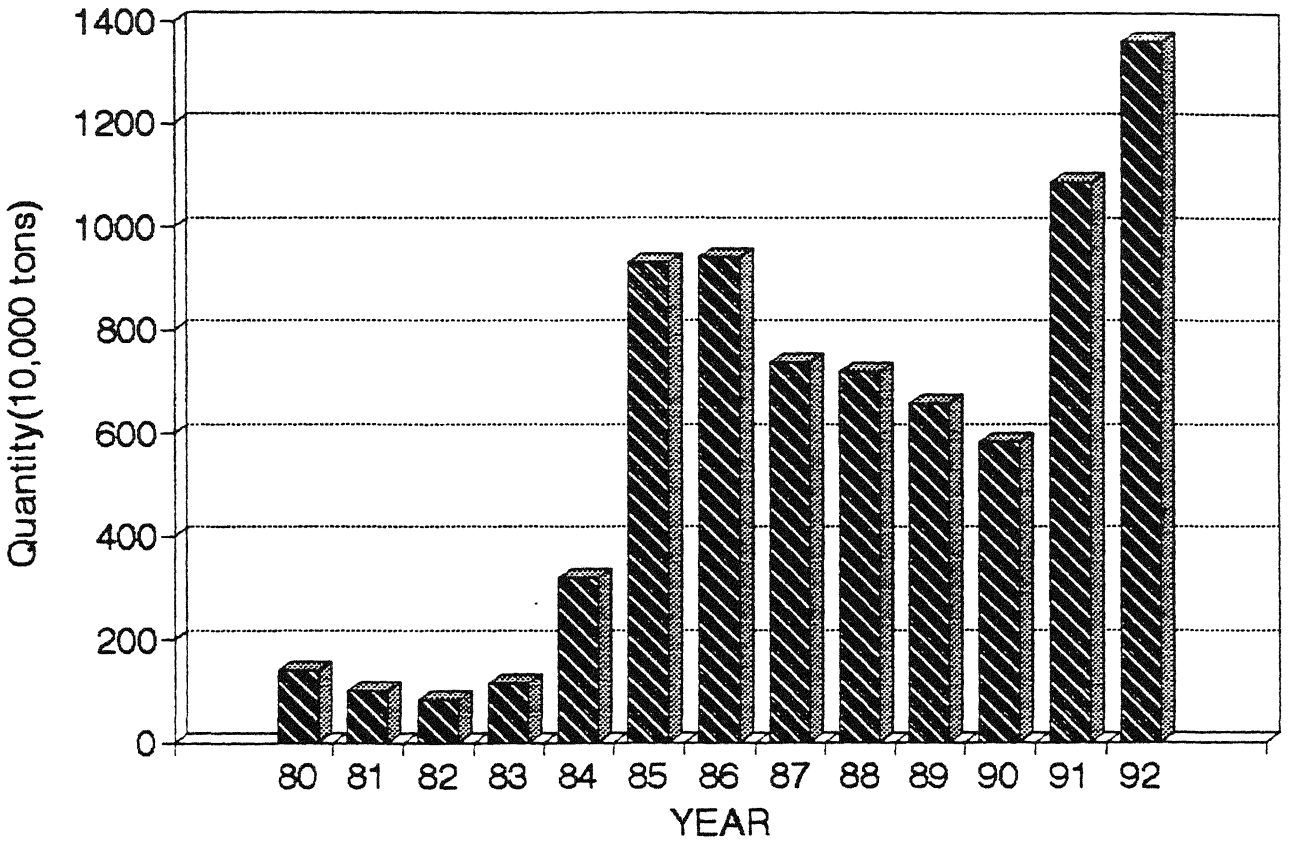
Export of Pork, Quantity
Mainland China(1980-1992)



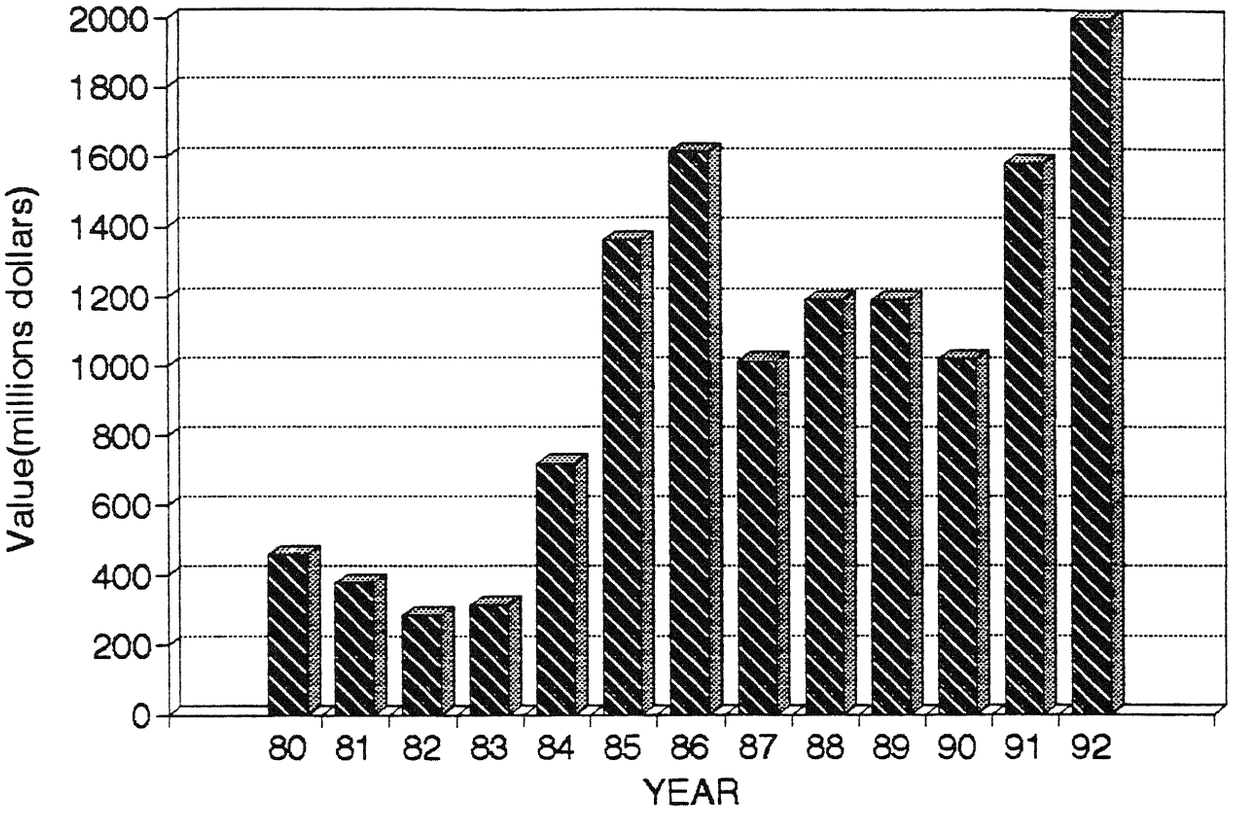
Production of Grain, Quantity
Mainland China(1980-1992)

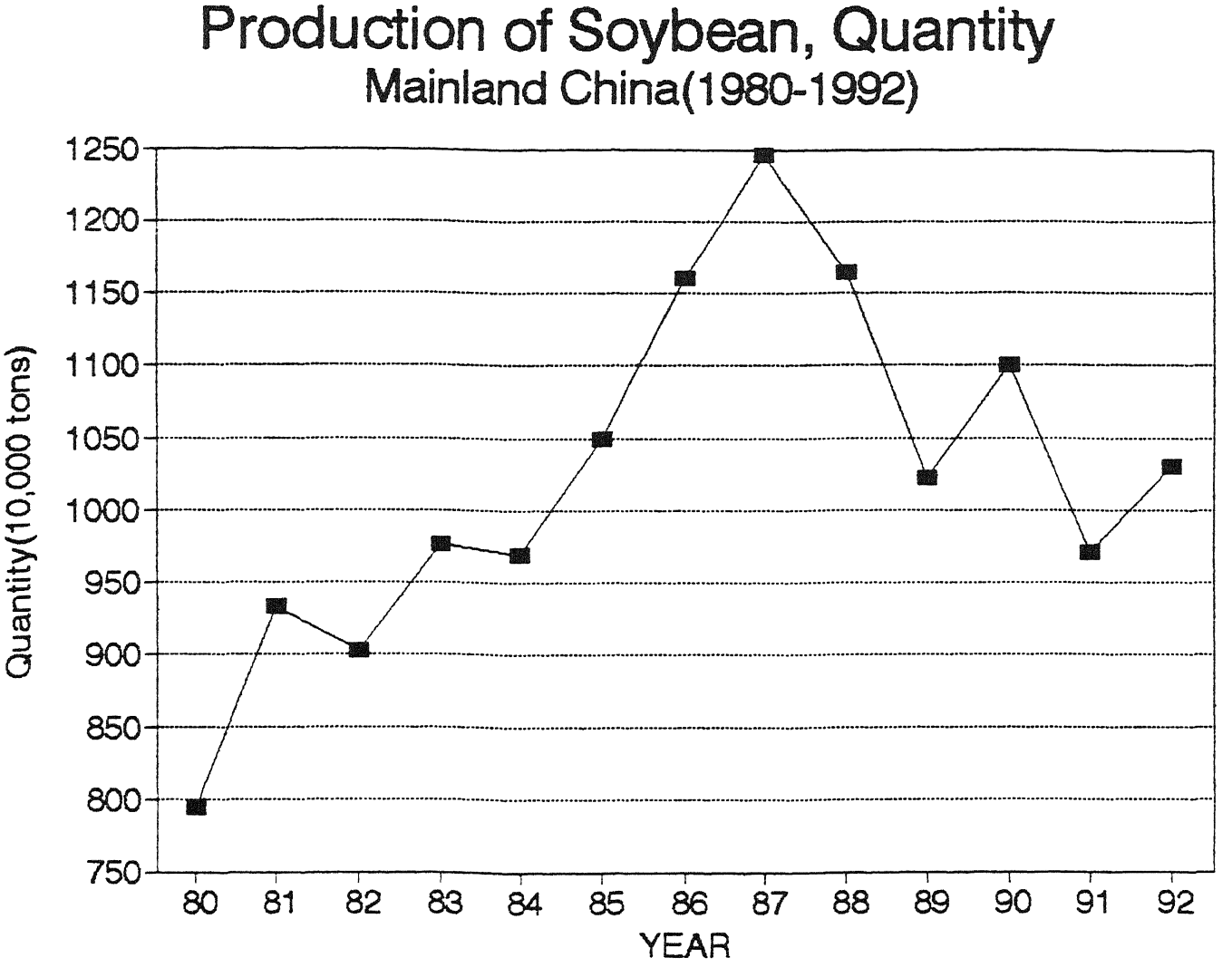


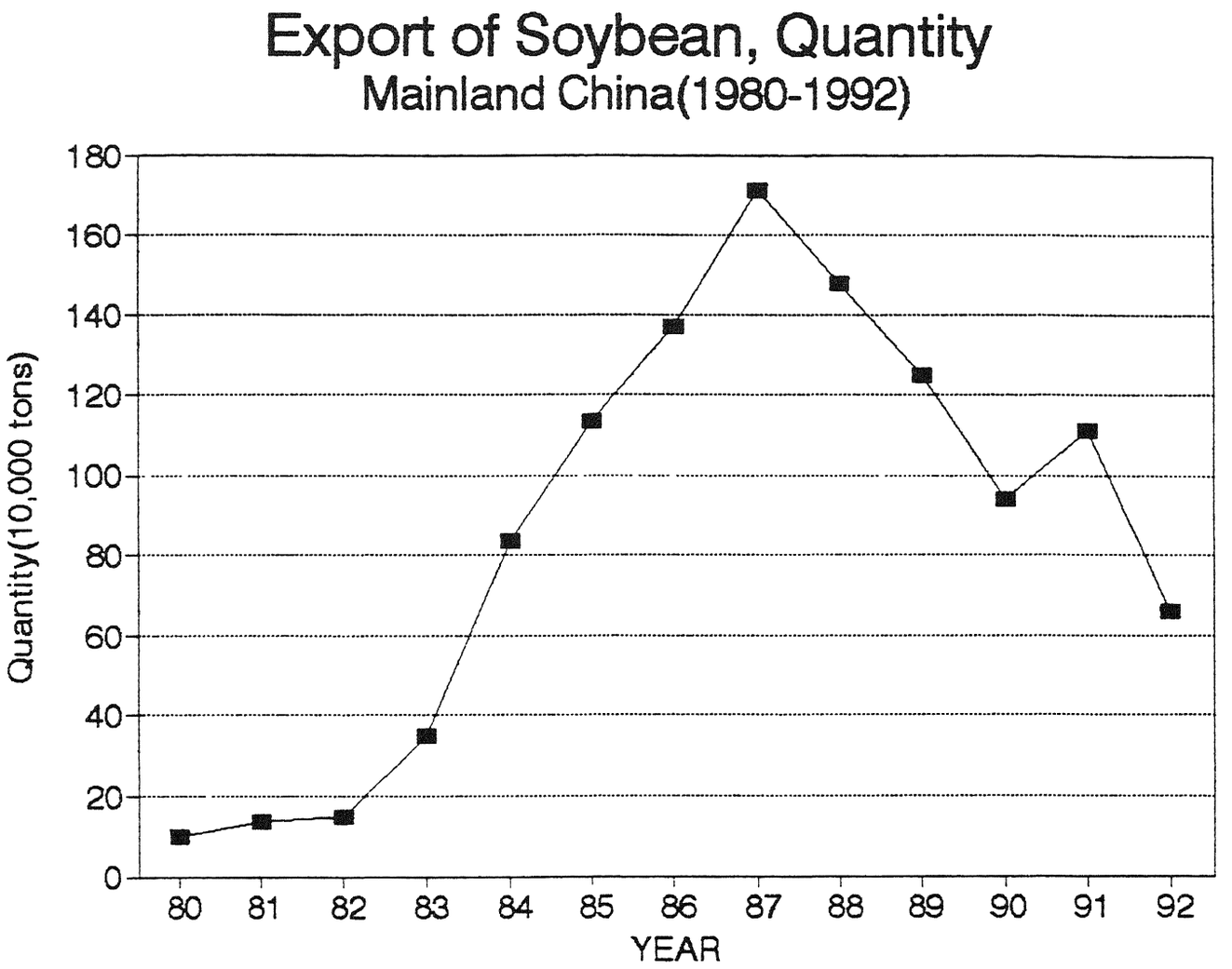
Export OF Grain, Quantity
Mainland China (1980-1992)

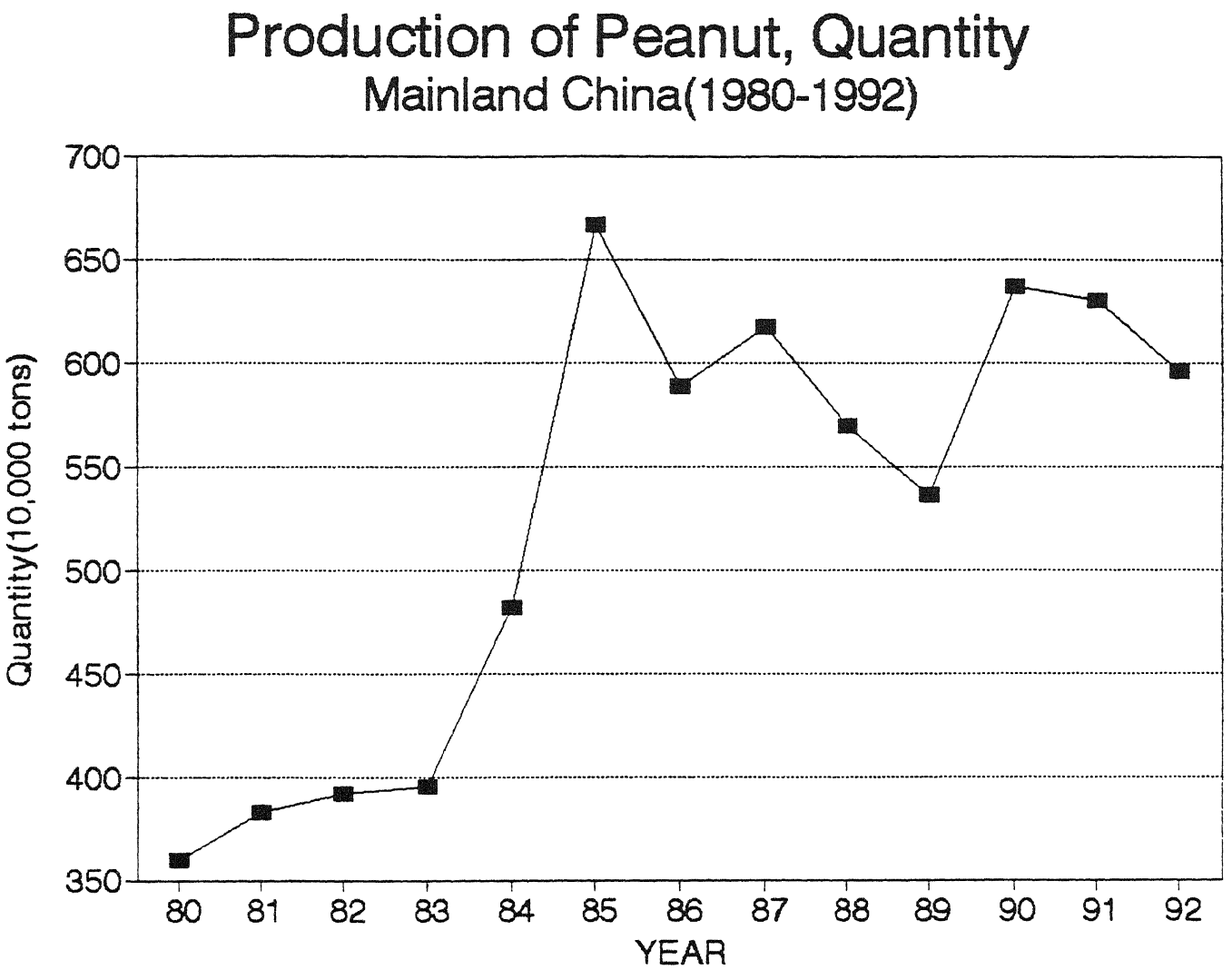


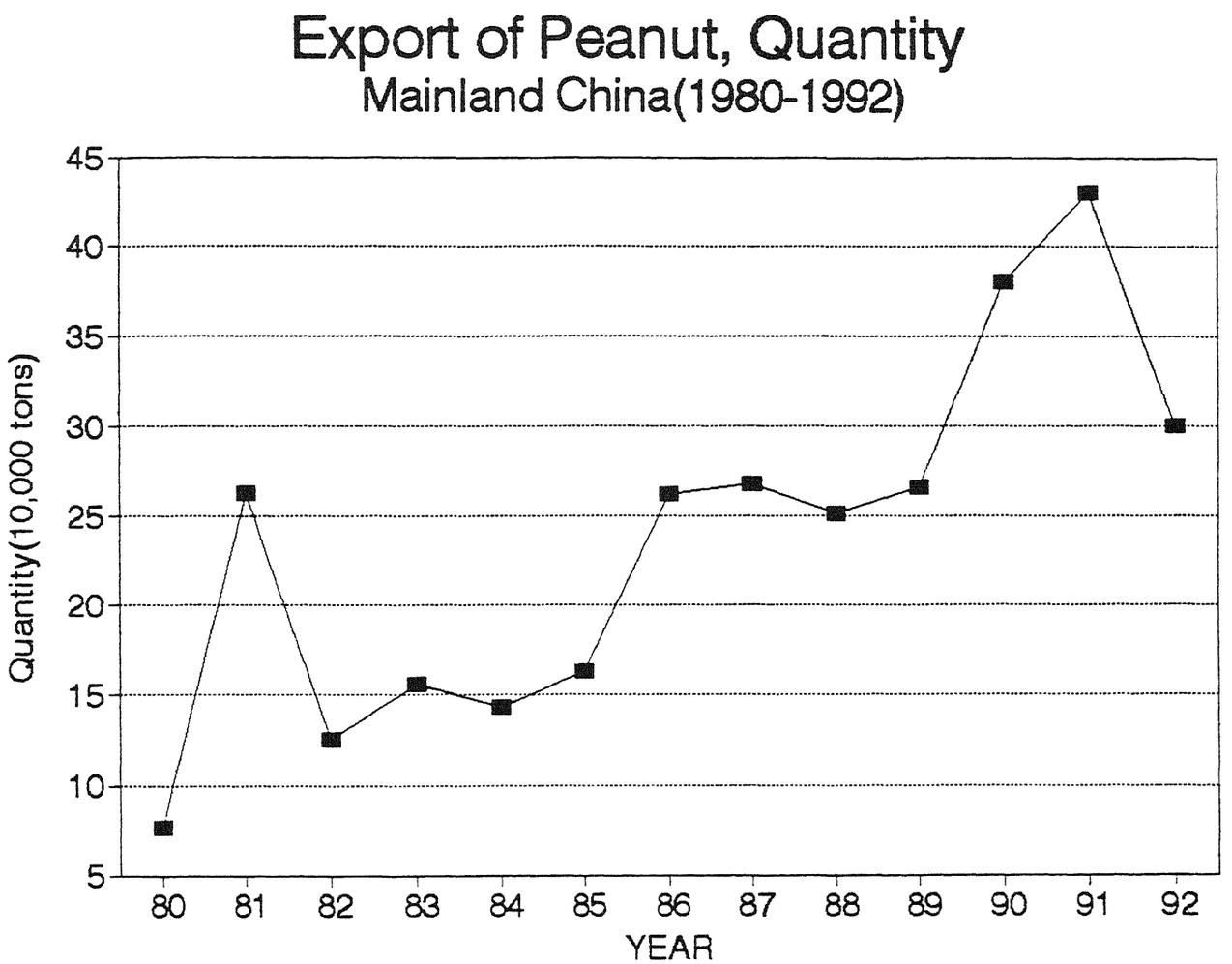
Export of Grain, Value
Mainland China (1980-1992)

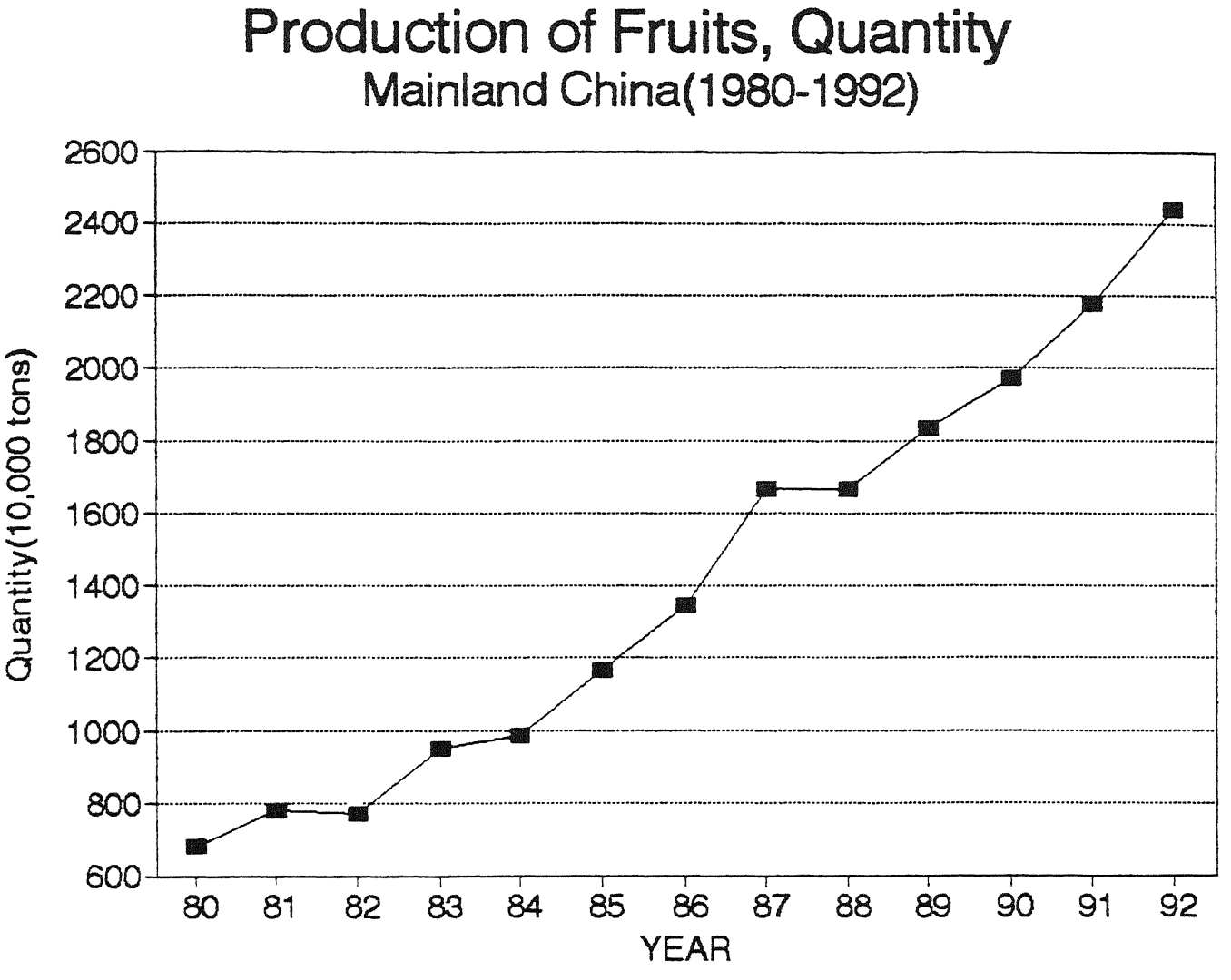


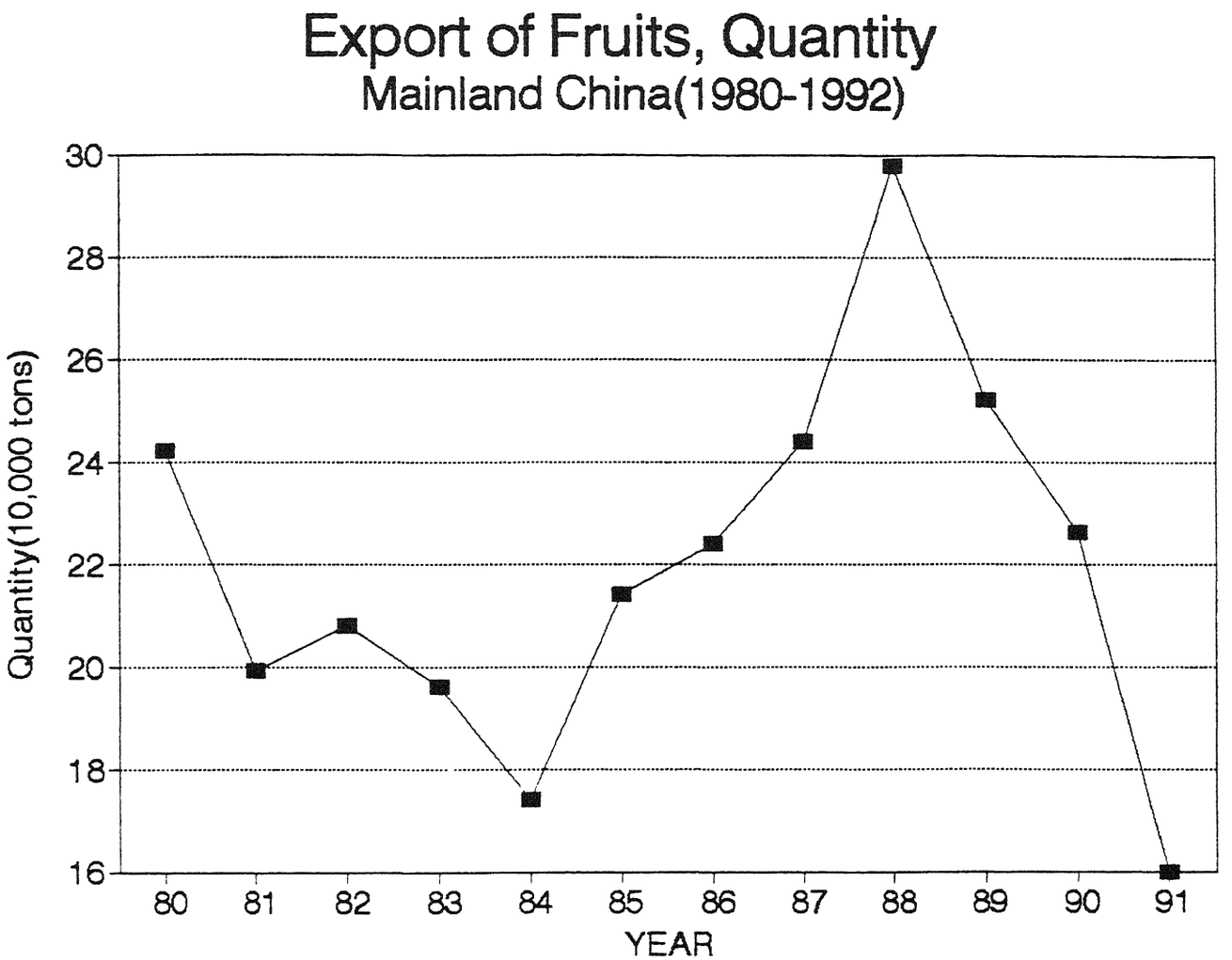

Production of Soybean, Quantity
Mainland China(1980-1992)
Quantity(10,000 tons)
1250
1200
1150
1100
1050
1000
950
900
850
800
750
80
81
82
83
84
85
86
87
88
89
90
91
92
YEAR


Export of Soybean, Quantity
Mainland China(1980-1992)
Quantity(10,000 tons)
180
160
140
120
100
80
60
40
20
0
80
81
82
83
84
85
86
87
88
89
90
91
92
YEAR


Production of Peanut, Quantity
Mainland China(1980-1992)
Quantity(10,000 tons)
700
650
600
550
500
450
400
350
80
81
82
83
84
85
86
87
88
89
90
91
92
YEAR

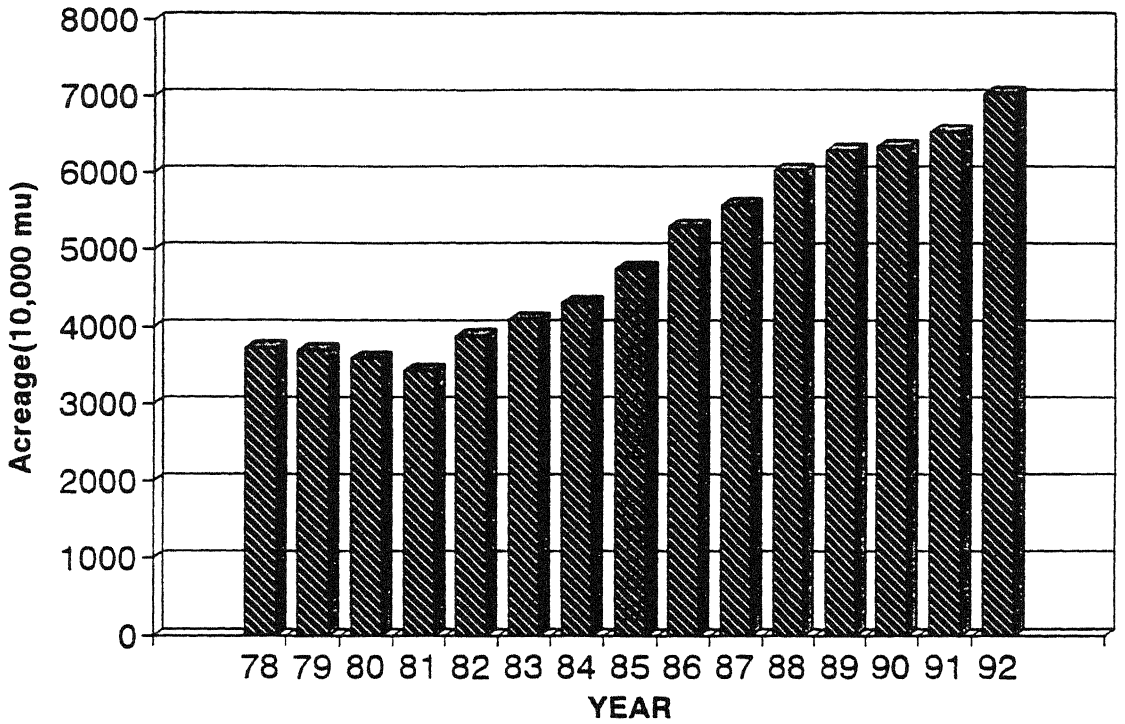

Export of Peanut, Quantity
Mainland China(1980-1992)
Quantity(10,000 tons)
45
40
35
30
25
20
15
10
5
80
81
82
83
84
85
86
87
88
89
90
91
92
YEAR


Production of Fruits, Quantity
Mainland China(1980-1992)
Quantity(10,000 tons)
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
80
81
82
83
84
85
86
87
88
89
90
91
92
YEAR

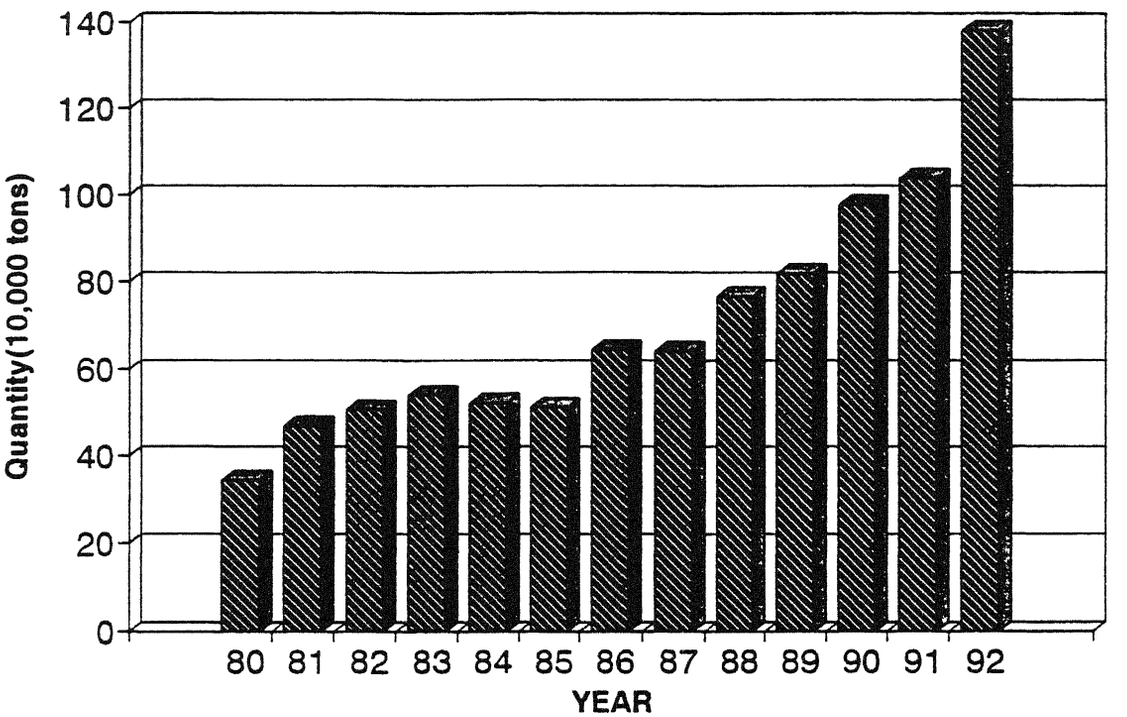

Export of Fruits, Quantity
Mainland China(1980-1992)
Quantity(10,000 tons)
30
28
26
24
22
20
18
16
80
81
82
83
84
85
86
87
88
89
90
91
YEAR

Production of Vegetables, Acreage

Mainland China(1978-1992)

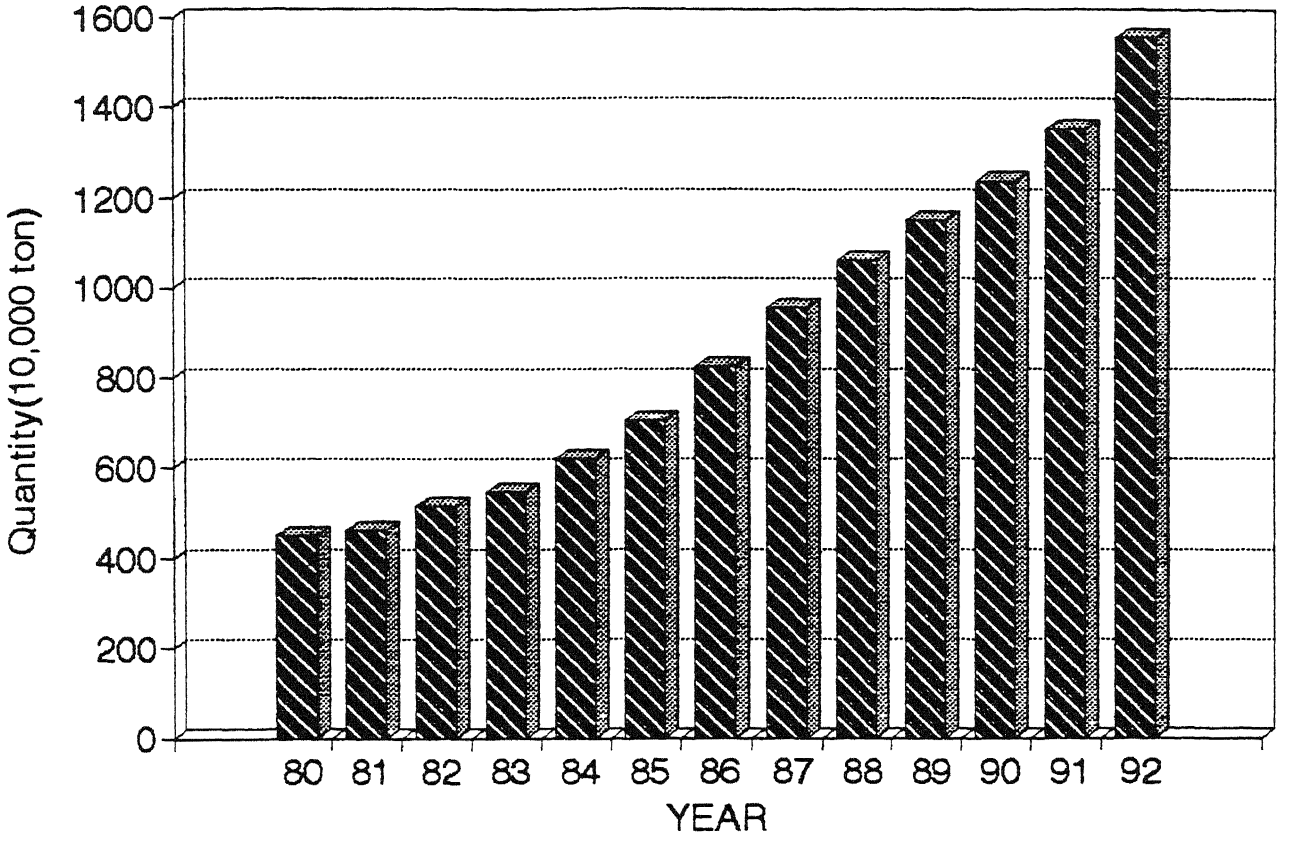


Export of Vegetable, Quantity
Mainland China(1980-1992)

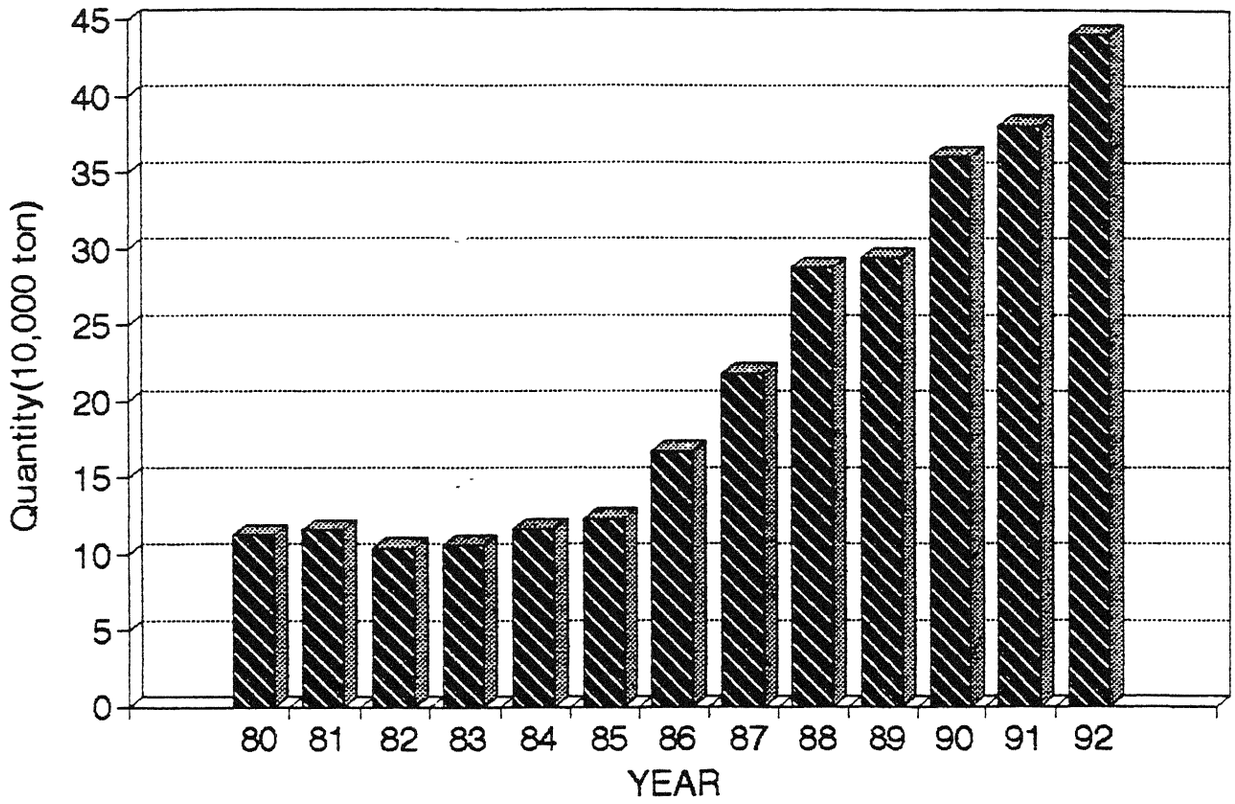


Production of Aquatic Products

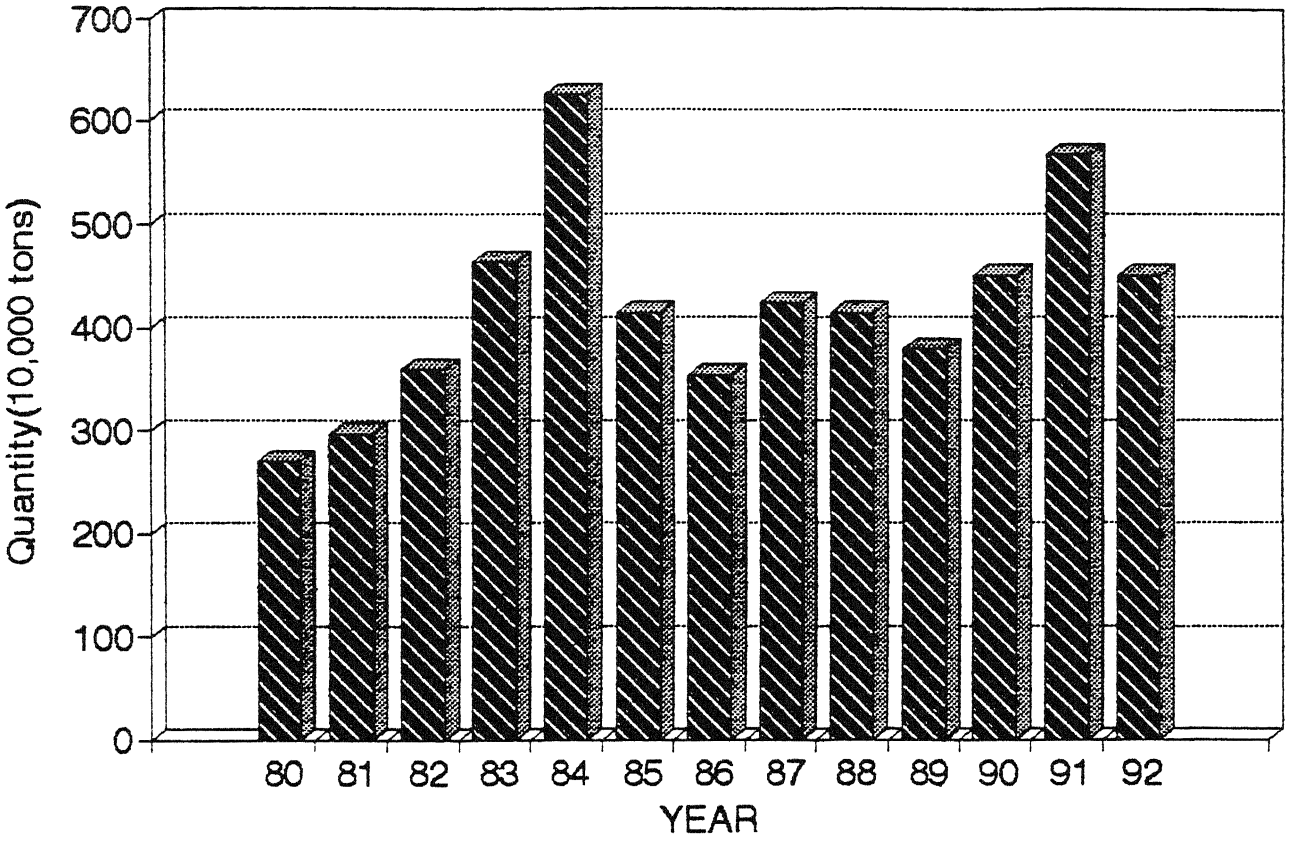
Quantity, Mainland China(1980-1992)



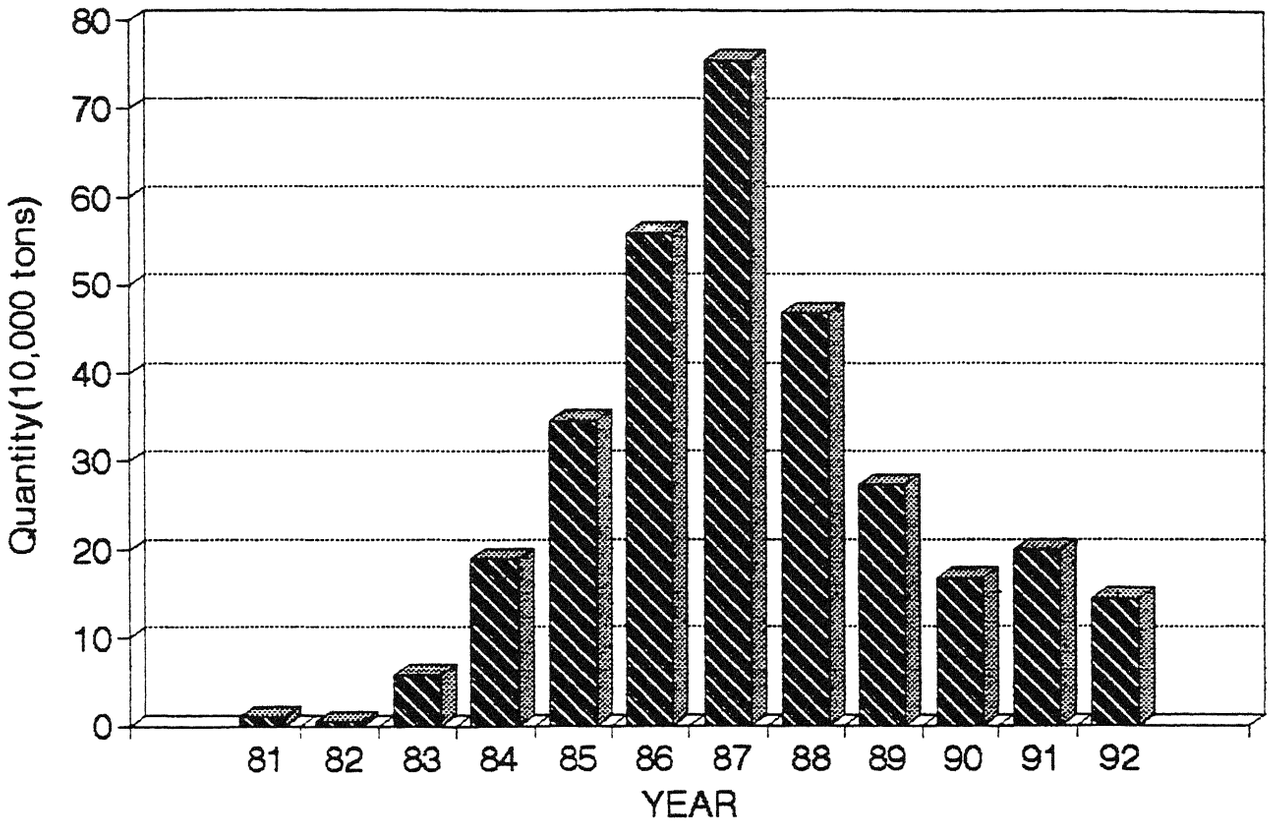
Export of Aquatic Products
Quantity, Mainland China(1980-1992)

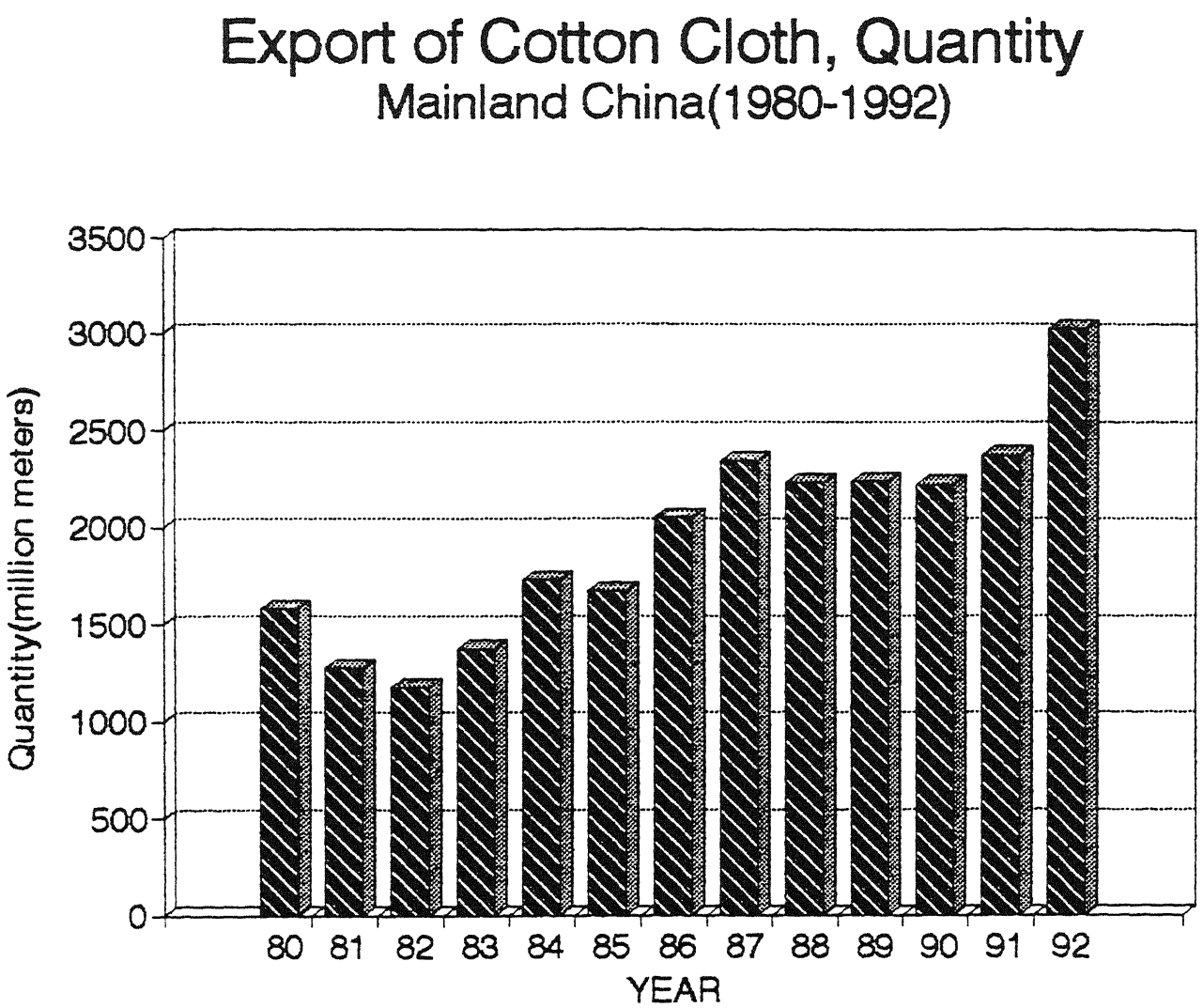


Production of Cotton, Quantity
Mainland China(1980-1992)



Export of Cotton, Quantity
Mainland China(1980-1992)




Export of Cotton Cloth, Quantity
Mainland China(1980-1992)
Quantity(million meters)
3500
3000
2500
2000
1500
1000
500
0
80
81
82
83
84
85
86
87
88
89
90
91
92
YEAR

Appendix C

Trends of Agricultural Exports and Imports in Mainland China

Quarterly Data, 1983-1992

Table 1: Major Agricultural Export, Quantity, Value and Price. Mainland China

Export items	Swine, live	Swine, live	Price	Poultry, live	Poultry, live	Price
Year/quarter	1000 dollars	1,000 head	Dollars/head	1000 dollars	1,000 head	Dollars/head
1983-1	55176.7	750.0	73.57	10829.49	4800.00	2.26
1983-2	58973.3	820.0	71.92	11207.85	5170.00	2.17
1983-3	58961.2	860.0	68.56	9445.28	5600.00	1.69
1983-4	56301.2	780.0	72.18	8691.26	5110.00	1.70
1984-1	52031.2	730.0	71.28	10141.26	4990.00	2.03
1984-2	53803.8	780.0	68.98	10846.83	4950.00	2.19
1984-3	49849.8	780.0	63.91	9966.62	6310.00	1.58
1984-4	47763.2	790.0	60.46	11671.04	7750.00	1.51
1985-1	39101.5	670.0	58.36	9731.16	5910.00	1.65
1985-2	40031.6	660.0	60.65	12322.81	6500.00	1.90
1985-3	46474.4	770.0	60.36	15204.26	9750.00	1.56
1985-4	52172.9	860.0	60.67	17839.72	12360.00	1.44
1986-1	40832.6	710.0	57.51	15659.49	9490.00	1.65
1986-2	47703.8	770.0	61.95	17172.76	9620.00	1.79
1986-3	55039.4	840.0	65.52	17757.26	11100.00	1.60
1986-4	51250.0	790.0	64.87	19306.45	12240.00	1.58
1987-1	34594.3	530.0	65.27	15362.71	9370.00	1.64
1987-2	51311.1	780.0	65.78	17262.22	9860.00	1.75
1987-3	53111.2	790.0	67.23	17740.46	9960.00	1.78
1987-4	63135.4	920.0	68.63	21448.15	11960.00	1.79
1988-1	50620.0	720.0	70.31	19290.00	10640.00	1.81
1988-2	57520.0	770.0	74.70	16780.00	9460.00	1.77
1988-3	61250.0	760.0	80.59	19890.00	11600.00	1.71
1988-4	63530.0	780.0	81.45	20580.00	12490.00	1.65
1989-1	60280.0	730.0	82.58	17980.00	10480.00	1.72
1989-2	61420.0	750.0	81.89	20360.00	11300.00	1.80
1989-3	59440.0	750.0	79.25	19000.00	11390.00	1.67
1989-4	61270.0	750.0	81.69	19600.00	11670.00	1.68
1990-1	57640.0	680.0	84.76	19290.00	11120.00	1.73
1990-2	63270.0	690.0	91.70	17850.00	9980.00	1.79
1990-3	73920.0	800.0	92.40	22790.00	12620.00	1.81
1990-4	76070.0	820.0	92.77	24600.00	14110.00	1.74
1991-1	59680.00	650.00	91.82	17980.00	10380.00	1.73
1991-2	69940.00	730.00	95.81	20170.00	11600.00	1.74
1991-3	74800.00	750.00	99.73	20000.00	11650.00	1.72
1991-4	71930.00	720.00	99.90	23880.00	13890.00	1.72
1992-1	64230.00	670.00	95.87	19300.00	12100.00	1.60
1992-2	75880.00	740.00	102.54	22710.00	12580.00	1.81
1992-3	76270.00	750.00	101.69	24550.00	13530.00	1.81
1992-4	73180.00	730.00	100.25	26780.00	14620.00	1.83
1993-1	66550.00	680.00	97.87	21660.00	12160.00	1.78
1993-2	70550.00	670.00	105.30	20280.00	11320.00	1.79
1993-3	67520.00	700.00	96.46	22590.00	12750.00	1.77
1993-4	66980.00	690.00	97.07	25800.00	15030.00	1.72

Table 1: Major Agricultural Export, Quantity, Value and Price. Mainland China

Export items	Beef	Beef	Price	Pork	Pork	Price
Year/quarter	1000 dollars	Tons	1000 dols/ton	1000 dollars	Tons	1000 dols/ton
1983-1	2959.55	2704.00	1.09	31843.32	19287.00	1.65
1983-2	3276.30	2603.00	1.26	34247.61	20614.00	1.66
1983-3	2491.17	2003.00	1.24	76238.02	39368.00	1.94
1983-4	11288.53	8690.00	1.30	32491.16	18269.00	1.78
1984-1	6239.65	4814.00	1.30	28933.27	17373.00	1.67
1984-2	3058.77	2602.00	1.18	58412.77	33568.00	1.74
1984-3	826.03	788.00	1.05	43491.86	29878.00	1.46
1984-4	5833.65	6430.00	0.91	25623.83	18778.00	1.36
1985-1	13466.57	10579.00	1.27	24120.98	17861.00	1.35
1985-2	1740.35	1392.00	1.25	16635.09	14204.00	1.17
1985-3	9258.50	6200.00	1.49	65695.16	42774.00	1.54
1985-4	20528.98	13481.00	1.52	58036.11	36221.00	1.60
1986-1	2270.03	2043.00	1.11	19158.09	13516.00	1.42
1986-2	4973.45	3011.00	1.65	34411.12	22044.00	1.56
1986-3	15099.10	9194.00	1.64	77768.12	42277.00	1.84
1986-4	17217.74	11456.00	1.50	46220.43	26833.00	1.72
1987-1	22600.75	12474.00	1.81	24707.15	15767.00	1.57
1987-2	15454.06	8905.00	1.74	56526.06	30601.00	1.85
1987-3	9099.95	5762.00	1.58	50153.14	30345.00	1.65
1987-4	9312.20	6446.00	1.44	41848.47	23251.00	1.80
1988-1	14420.00	7699.00	1.87	17070.00	10193.00	1.67
1988-2	38790.00	17398.00	2.23	32020.00	16520.00	1.94
1988-3	33770.00	17099.00	1.97	37060.00	20374.00	1.82
1988-4	21000.00	11789.00	1.78	29680.00	16398.00	1.81
1989-1	10920.00	5769.00	1.89	26090.00	14385.00	1.81
1989-2	51470.00	24874.00	2.07	44580.00	23820.00	1.87
1989-3	32380.00	18069.00	1.79	62770.00	34781.00	1.80
1989-4	11170.00	7781.00	1.44	25860.00	15437.00	1.68
1990-1	11420.00	7222.00	1.58	29080.00	17890.00	1.63
1990-2	44370.00	25770.00	1.72	70820.00	40789.00	1.74
1990-3	50460.00	30610.00	1.65	51410.00	29674.00	1.73
1990-4	52490.00	32991.00	1.59	64170.00	35883.00	1.79
1991-1	55190.00	34609.00	1.59	46420.00	27424.00	1.69
1991-2	47900.00	31009.00	1.54	52160.00	34082.00	1.53
1991-3	61320.00	38963.00	1.57	50480.00	31376.00	1.61
1991-4	39460.00	27459.00	1 44	36600.00	23753.00	1.54
1992-1	20110.00	13586.00	1 48	29690.00	18048.00	1.65
1992-2	9130.00	5839.00	1.56	21650.00	13877.00	1.56
1992-3	3890.00	2520.00	1.54	12610.00	7835.00	1.61
1992-4	5710.00	4526.00	1.26	12480.00	8428.00	1.48
1993-1	6250.00	5128.00	1.22	7590.00	5922.00	1.28
1993-2	3620.00	2933.00	1.23	9460.00	7715.00	1.23
1993-3	4990.00	4320.00	1.16	14600.00	13507.00	1.08
1993-4	13010.00	10000.00	1.30	31010.00	30000.00	1.03

Table 1: Major Agricultural Export, Quantity, Value and Price. Mainland China

Export items	Food grain	Food grain	Price	Rice (milled)	Rice (milled)	Price
Year/quarter	1000 dollars	1,000 tons	Dollars/ton	1000 dollars	1,000 tons	Dollars/ton
1983-1	67137.74	250.00	268.55	35089.61	120.00	292.41
1983-2	68203.32	260.00	262.32	33296.43	100.00	332.96
1983-3	78134.14	270.00	289.39	38915.78	130.00	299.35
1983-4	99423.95	370.00	268.71	58206.16	230.00	253.07
1984-1	91509.99	330.00	277.30	34978.08	140.00	249.84
1984-2	177769.55	640.00	277.76	51161.50	200.00	255.81
1984-3	211255.74	1000.00	211.26	89278.26	410.00	217.75
1984-4	205144.25	1220.00	168.15	87939.30	410.00	214.49
1985-1	263728.33	1810.00	145.71	44110.36	150.00	294.07
1985-2	369694.74	2550.00	144.98	63912.28	300.00	213.04
1985-3	349536.56	2380.00	146.86	57511.16	280.00	205.40
1985-4	390662.02	2590.00	150.83	63078.87	270.00	233.63
1986-1	293208.61	2050.00	143.03	37040.85	160.00	231.51
1986-2	458600.44	3070.00	149.38	52680.41	270.00	195.11
1986-3	312275.32	2310.00	135.18	52199.29	280.00	186.43
1986-4	259954.30	1990.00	130.63	48241.94	240.00	201.01
1987-1	230472.86	1650.00	139.68	41469.64	220.00	188.50
1987-2	310591.08	2050.00	151.51	58573.35	330.00	177.49
1987-3	213723.80	1610.00	132.75	37450.30	210.00	178.33
1987-4	233331.54	1770.00	131.83	50816.77	260.00	195.45
1988-1	254420.00	1440.00	176.68	36970.00	150.00	246.47
1988-2	338790.00	2010.00	168.55	55090.00	220.00	250.41
1988-3	294940.00	1840.00	160.29	46460.00	180.00	258.11
1988-4	300920.00	1890.00	159.22	42470.00	160.00	265.44
1989-1	223400.00	1330.00	167.97	18810.00	70.00	268.71
1989-2	344110.00	1850.00	186.01	27140.00	90.00	301.56
1989-3	334040.00	1840.00	181.54	26170.00	80.00	327.13
1989-4	290080.00	1550.00	187.15	22350.00	0.00	
1990-1	191090.00	940.00	203.29	16080.00	50.00	321.60
1990-2	275940.00	1520.00	181.54	15720.00	50.00	314.40
1990-3	277110.00	1620.00	171.06	17040.00	70.00	243.43
1990-4	274990.00	1750.00	157.14	35290.00	160.00	220.56
1991-1	291250.00	1890.00	154.10	25790.00	130.00	198.38
1991-2	402850.00	2790.00	144.39	34550.00	160.00	215.94
1991-3	411300.00	2970.00	138.48	21790.00	100.00	217.90
1991-4	476020.00	3220.00	147.83	69710.00	300.00	232.37
1992-1	298660.00	2370.00	126.02	41260.00	180.00	229.22
1992-2	405090.00	3200.00	126.59	48620.00	210.00	231.52
1992-3	315000.00	2460.00	128.05	38190.00	170.00	224.65
1992-4	527840.00	3980.00	132.62	89780.00	390.00	230.21
1993-1	285960.00	2470.00	115.77	34650.00	180.00	192.50
1993-2	360740.00	3190.00	113.08	45100.00	230.00	196.09
1993-3	457890.00	3990.00	114.76	103920.00	580.00	179.17
1993-4	410700.00	3650.00	112.52	69090.00	430.00	160.67

Table 1: Major Agricultural Export, Quantity, Value and Price. Mainland China

Export items	Corn (maize)	Corn (maize)	Price	Soybeans	Soybeans	Price
Year/quarter	1000 dollars	1,000 tons	Dollars/ton	1000 dollars	1,000 tons	Dollars/ton
1983-1	0.00	0.00		22206.86	100.00	222.07
1983-2	0.00	0.00		19969.80	80.00	249.62
1983-3	0.00	0.00		22128.09	80.00	276.60
1983-4	0.00	0.00		25528.04	90.00	283.64
1984-1	0.00	0.00		40603.99	130.00	312.34
1984-2	0.00	0.00		99352.15	330.00	301.07
1984-3	30888.61	260.00	118.80	69920.73	250.00	279.68
1984-4	72480.33	630.00	115.05	32600.22	130.00	250.77
1985-1	120346.66	1200.00	100.29	79416.34	330.00	240.66
1985-2	177757.89	1630.00	109.05	99336.84	410.00	242.28
1985-3	214030.21	1730.00	123.72	47672.50	210.00	227.01
1985-4	238508.08	1780.00	133.99	42492.87	200.00	212.46
1986-1	158995.95	1330.00	119.55	44836.30	210.00	213.51
1986-2	197569.51	1750.00	112.90	142752.26	620.00	230.25
1986-3	167814.28	1540.00	108.97	50263.37	230.00	218.54
1986-4	93760.75	1020.00	91.92	63384.41	320.00	198.08
1987-1	6358.14	840.00	7.57	87702.85	420.00	208.82
1987-2	69266.52	870.00	79.62	153065.56	720.00	212.59
1987-3	88589.47	1050.00	84.37	68181.09	290.00	235.11
1987-4	101671.14	1160.00	87.65	62939.28	280.00	224.78
1988-1	68470.00	700.00	97.81	96240.00	400.00	240.60
1988-2	109500.00	1110.00	98.65	111020.00	450.00	246.71
1988-3	106010.00	1080.00	98.16	91720.00	360.00	254.78
1988-4	109500.00	1030.00	106.31	81960.00	280.00	292.71
1989-1	83250.00	680.00	122.43	54700.00	180.00	303.89
1989-2	115910.00	890.00	130.24	110960.00	360.00	308.22
1989-3	133760.00	1090.00	122.72	114370.00	400.00	285.93
1989-4	105890.00	840.00	126.06	85580.00	320.00	267 44
1990-1	51270.00	420.00	122.07	57610.00	250.00	230.44
1990-2	103010.00	860.00	119.78	63360.00	260.00	243.69
1990-3	124920.00	1030.00	121.28	69600.00	280.00	248.57
1990-4	124360.00	1100.00	113.05	37720.00	150.00	251.47
1991-1	130990.00	1210.00	108.26	58670.00	240.00	244.46
1991-2	217850.00	1990.00	109.47	65100.00	270.00	241.11
1991-3	252150.00	2280.00	110.59	69170.00	300.00	230.57
1991-4	263480.00	2310.00	114.06	69270.00	300.00	230.90
1992-1	241570.00	2080.00	116.14	56200.00	240.00	234.17
1992-2	327900.00	2790.00	117.53	58690.00	240.00	244.54
1992-3	243550.00	2080.00	117.09	23450.00	90.00	260.56
1992-4	406730.00	3360.00	121.05	21250.00	90.00	236.11
1993-1	234260.00	2180.00	107.46			
1993-2	286180.00	2730.00	104.83			
1993-3	328840.00	3220.00	102.12			
1993-4	304720.00	2970.00	102.60			

Table 1: Major Agricultural Export, Quantity, Value and Price. Mainland China

Export items	Fruits	Fruits	Price	Oranges	Oranges	Price
Year/quarter	1000 dollars	Tons	1000 dols/ton	1000 dollars	Tons	1000 dols/ton
1983-1	13072.20	28615.00	0.46	6221.20	11107.00	0.56
1983-2	3598.39	11336.00	0.32	60.39	225.00	0.27
1983-3	20529.50	58499.00	0.35	10.09	36.00	0.28
1983-4	36200.10	97587.00	0.37	12501.26	30953.00	0.40
1984-1	10019.48	23555.00	0.43	5265.47	9320.00	0.56
1984-2	2572.88	7715.00	0.33	4.63	9.00	0.51
1984-3	15064.66	46015.00	0.33	4.17	11.00	0.38
1984-4	31978.27	96940.00	0.33	9542.90	26259.00	0.36
1985-1	10134.42	23638.00	0.43	5871.95	11869.00	0.49
1985-2	1519.30	5649.00	0.27	14.04	61 00	0.23
1985-3	17318.92	52434.00	0.33	20.60	50.00	0.41
1985-4	49363.32	132392.00	0.37	16908.46	40328.00	0.42
1986-1	11406.30	25961.00	0.44	6913.00	13302.00	0.52
1986-2	5716.96	17130.00	0.33	699.78	1624.00	0.43
1986-3	18172.69	53258.00	0.34	35.30	194.00	0.18
1986-4	51674.73	127510.00	0.41	19798.39	46119.00	0.43
1987-1	16182.16	36534.00	0.44	8573.35	17647.00	0.49
1987-2	4709.83	12166.00	0.39	424.50	950.00	0.45
1987-3	14779.69	44415.00	0.33	21.49	17.00	1.26
1987-4	65674.37	150677.00	0.44	27270.28	57546.00	0.47
1988-1	26120.00	51022.00	0.51	15340.00	28434.00	0.54
1988-2	9540.00	20471.00	0.47	2500.00	4574.00	0.55
1988-3	24590.00	58904.00	0.42	1970.00	2686.00	0.73
1988-4	65530.00	150424.00	0.44	18490.00	39011.00	0.47
1989-1	20260.00	40962.00	0 49	11740.00	21418.00	0.55
1989-2	8270.00	20526.00	0.40	1470.00	2869.00	0.51
1989-3	22510.00	54136.00	0.42	0.00	0.00	
1989-4	57460.00	136382.00	0.42	21410.00	46227.00	0.46
1990-1	23130.00	50484.00	0.46	12270.00	24079.00	0.51
1990-2	5590.00	14146.00	0.40	740.00	1705.00	0.43
1990-3	22080 00	46380.00	0.48	10.00	18.00	0.56
1990-4	52050 00	115288.00	0.45	18070.00	39822.00	0.45
1991-1	18410 00	35083.00	0.52	12480.00	22955.00	0.54
1991-2	6730.00	15890.00	0.42	1220.00	2682.00	0.45
1991-3	16780.00	35671.00	0.47	30.00	83.00	0.36
1991-4	36810.00	76919.00	0.48	8890.00	17693.00	0.50
1992-1	58740.00	60000.00	0.98	17480.00	32185.00	0.54
1992-2	35580.00	30000.00	1.19	1490.00	3229.00	0.46
1992-3	32680.00	50000.00	0.65	40.00	34.00	1.18
1992-4	141340.00	140000.00	1.01	13410.00	25926.00	0.52
1993-1	55330.00	80000.00	0.69	18010.00	37219.00	0.48
1993-2	39690.00	50000.00	0.79	1440.00	3883.00	0.37
1993-3	30550.00	50000.00	0.61	80.00	259.00	0.31
1993-4	206040.00	270000.00	0.76	18300.00	39678.00	0.46

Table 1. Major Agricultural Export, Quantity, Value and Price. Mainland China

Export items	Apples	Apples	Price	Walnuts,in shell	Walnuts,in shell	Price
Year/quarter	1000 dollars	Tons	1000 dols/ton	1000 dollars	Tons	1000 dols/ton
1983-1	1638.50	4133.00	0.40	1121.35	1502.00	0.75
1983-2	176.14	357.00	0.49	1892.30	2193.00	0.86
1983-3	2324.76	7557.00	0.31	55.47	41.00	1.35
1983-4	15750.38	44231.00	0.36	7225.87	9684.00	0.75
1984-1	375.06	1458.00	0.26	1232.34	1790.00	0.69
1984-2	138.82	310.00	0.45	680.24	989.00	0.69
1984-3	1134.75	3135.00	0.36	112.64	183.00	0.62
1984-4	11509.93	39110.00	0.29	5829.90	8283.00	0 70
1985-1	38.91	147.00	0.26	1280.51	1844.00	0.69
1985-2	122.81	311.00	0.39	631.58	854.00	0.74
1985-3	494.34	1584.00	0.31	44.63	79.00	0.56
1985-4	18200.82	53147.00	0.34	7079.51	9067.00	0.78
1986-1	71.72	290.00	0.25	1830.37	2512.00	0.73
1986-2	165.57	309.00	0.54	1743.21	2401.00	0.73
1986-3	154.49	4176.00	0.04	2.72	2.00	1.36
1986-4	17830.65	43360.00	0.41	9263.44	8871.00	1.04
1987-1	2565.82	5163.00	0.50	1206.34	1243.00	0.97
1987-2	564.21	978.00	0.58	3285.87	3235.00	1.02
1987-3	607.20	1886.00	0.32	139.71	222.00	0.63
1987-4	22109.08	52318.00	0.42	5107.47	5077.00	1.01
1988-1	6520.00	11584 00	0.56	790.00	757.00	1.04
1988-2	4460.00	7992.00	0.56	510.00	582.00	0.88
1988-3	1670.00	4131.00	0.40	300.00	338.00	0.89
1988-4	26750.00	64150.00	0.42	6670.00	6694.00	1.00
1989-1	4600.00	9181.00	0.50	1780.00	1716.00	1.04
1989-2	3570.00	7006.00	0 51	2320.00	2364.00	0.98
1989-3	540.00	1466.00	0.37	850.00	977.00	0.87
1989-4	18400.00	52679.00	0.35	3700.00	3627.00	1.02
1990-1	6920.00	17238.00	0 40	1020.00	942.00	1.08
1990-2	1500.00	3308.00	0.45	1040.00	1194.00	0.87
1990-3	250.00	669.00	0.37	440.00	490.00	0.90
1990-4	16920.00	41209.00	0 41	2950.00	2620.00	1 13
1991-1	710 00	1241 00	0.57			
1991-2	470 00	753.00	0.62			
1991-3	40 00	90.00	0 44			
1991-4	8570.00	21999.00	0.39			
1992-1	1890.00	1943.00	0.97			
1992-2	1780.00	2473.00	0.72			
1992-3	400.00	724.00	0.55			
1992-4	16300 00	33176.00	0.49			
1993-1	2550 00	5216.00	0 49			
1993-2	830.00	2001 00	0.41			
1993-3	1510.00	2938 00	0.51			
1993-4	43080.00	109264.00	0.39			

Table 1: Major Agricultural Export, Quantity, Value and Price. Mainland China

Export items	Sugar	Sugar	Price	Tea	Tea	Price
Year/quarter	1000 dollars	Tons	1000 dols/ton	1000 dollars	Tons	1000 dols/ton
1983-1	2130.06	7793.00	0.27	55166.41	27964.00	1.97
1983-2	8117.77	32956.00	0.25	44026.17	25192.00	1.75
1983-3	3242.56	9840.00	0.33	61255.67	31311.00	1.96
1983-4	3163.21	9790.00	0.32	72521.48	40595.00	1.79
1984-1	2045.79	6221.00	0.33	54661.47	31293.00	1.75
1984-2	7089.31	29237.00	0.24	75122.63	36563.00	2.05
1984-3	2085.94	8081.00	0.26	66203.59	29610.00	2.24
1984-4	2195.58	8628.00	0.25	98149.12	47806.00	2.05
1985-1	2009.20	8404.00	0.24	47516.80	22451.00	2.12
1985-2	3628.07	20220.00	0.18	77182.46	32777.00	2.35
1985-3	12375.56	78672.00	0.16	58293.86	27899.00	2.09
1985-4	11910.04	76730.00	0.16	116357.30	53660.00	2.17
1986-1	2684.75	11995.00	0.22	60486.44	30093.00	2.01
1986-2	14036.24	70187.00	0.20	80343.64	38834.00	2.07
1986-3	22669.02	111059.00	0.20	80442.57	42871.00	1.88
1986-4	13833.33	72234.00	0.19	108400.54	60286.00	1.80
1987-1	14505.64	76445.00	0.19	64371.31	31756.00	2.03
1987-2	26700.70	129680.00	0.21	83159.59	40105.00	2.07
1987-3	36050.51	180516.00	0.20	90840.95	41130.00	2.21
1987-4	13315.42	65852.00	0.20	125669.00	61282.00	2.05
1988-1	5690.00	24329.00	0.23	64810.00	33126.00	1.96
1988-2	26040.00	109784.00	0.24	100520.00	47039.00	2.14
1988-3	24340.00	98612.00	0.25	96910.00	48075.00	2.02
1988-4	5980.00	15076.00	0.40	139730.00	70050.00	1.99
1989-1	3030.00	5399.00	0.56	64130.00	31970.00	2.01
1989-2	21320.00	60571.00	0.35	83380.00	38864.00	2.15
1989-3	62960.00	176596.00	0.36	110120.00	55338.00	1.99
1989-4	74090.00	187057.00	0.40	146610.00	72227.00	2.03
1990-1	51780.00	127855.00	0.40	58480.00	30913.00	1.89
1990-2	66290.00	161313.00	0.41	104480.00	49649.00	2.10
1990-3	80030.00	195885.00	0.41	110680.00	50757.00	2.18
1990-4	31800.00	85441.00	0.37	139070.00	64153.00	2.17
1991-1	10940.00	30303.00	0.36	49550.00	27089.00	1.83
1991-2	25370.00	80381.00	0.32	87750.00	43692.00	2.01
1991-3	39110.00	113178.00	0.35	100470.00	50232.00	2.00
1991-4	45230.00	119453.00	0.38	138290.00	63859.00	2.17
1992-1	66540.00	150566.00	0.44	36760.00	19663.00	1.87
1992-2	82420.00	206154.00	0.40	83600.00	39427.00	2.12
1992-3	305140.00	854086.00	0.36	108990.00	48388.00	2.25
1992-4	165960.00	459212.00	0.36	132540.00	68407.00	1.94
1993-1	137420.00	388162.00	0.35	56290.00	32453.00	1.73
1993-2	210100.00	696663.00	0.30	78410.00	43913.00	1.79
1993-3	134310.00	426405.00	0.31	101810.00	55973.00	1.82
1993-4	113950.00	341527.00	0.33	119110.00	69091.00	1.72

Table 1: Major Agricultural Export, Quantity, Value and Price. Mainland China

Export items	Canned food	Canned food	Price	Canned pork	Canned pork	Price
Year/quarter	1000 dollars	Tons	1000 dols/ton	1000 dollars	Tons	1000 dols/ton
1983-1	80911.42	97030.00	0.83	16758.83	13711.00	1.22
1983-2	92939.10	101500.00	0.92	30533.47	22688.00	1.35
1983-3	94543.62	105416.00	0.90	28789.71	21638.00	1.33
1983-4	82258.72	99730.00	0.82	18271.85	15364.00	1.19
1984-1	90209.45	102112.00	0.88	19702.87	16649.00	1.18
1984-2	107732.53	107069.00	1.01	42267.47	30054.00	1.41
1984-3	95223.20	100961.00	0.94	36554.03	25947.00	1.41
1984-4	78756.09	92243.00	0.85	17006.37	14311.00	1.19
1985-1	65932.08	68609.00	0.96	11634.24	9899.00	1.18
1985-2	79024.56	85136.00	0.93	12466.67	9432.00	1.32
1985-3	136162.03	118194.00	1.15	74857.54	50329.00	1.49
1985-4	119917.64	117935.00	1.02	43439.97	28929.00	1.50
1986-1	71456.19	78086.00	0.92	10396.01	7699.00	1.35
1986-2	90540.46	96747.00	0.94	25601.37	18788.00	1.36
1986-3	152085.26	132733.00	1.15	75427.64	43257.00	1.74
1986-4	125169.35	137711.00	0.91	27940.86	18920.00	1.48
1987-1	78979.04	101476.00	0.78	8718.43	7208.00	1.21
1987-2	148949.49	139754.00	1.07	55800.64	31293.00	1.78
1987-3	166195.59	147402.00	1.13	64570.12	36727.00	1.76
1987-4	143234.82	148326.00	0.97	27393.87	18529.00	1.48
1988-1	105530.00	105015.00	1.00	12300.00	9311.00	1.32
1988-2	175710.00	145585.00	1.21	43810.00	24191.00	1.81
1988-3	187150.00	150698.00	1.24	49300.00	26662.00	1.85
1988-4	180770.00	152873.00	1.18	38060.00	21365.00	1.78
1989-1	136440.00	111276.00	1.23	13170.00	8359.00	1.58
1989-2	201360.00	148200.00	1.36	51630.00	27683.00	1.87
1989-3	189920.00	151269.00	1.26	52250.00	30943.00	1.69
1989-4	146540.00	137610.00	1.06	30490.00	19356.00	1.58
1990-1	120450.00	96434.00	1.25	17610.00	11884.00	1.48
1990-2	238750.00	183583.00	1.30	62470.00	35290.00	1.77
1990-3	169530.00	136701.00	1.24	43610.00	25842.00	1.69
1990-4	170290.00	149030.00	1.14	29190.00	17890.00	1.63
1991-1				16360.00	10425.00	1.57
1991-2				43700.00	26420.00	1.65
1991-3				85970.00	54755.00	1.57
1991-4				47440.00	36809.00	1.29
1992-1				15000.00	10180.00	1.47
1992-2				25260.00	15594.00	1.62
1992-3				20720.00	13371.00	1.55
1992-4				23000.00	13930.00	1.65
1993-1				13990.00	8774.00	1.59
1993-2				32000.00	20388.00	1.57
1993-3				30940.00	20628.00	1.50
1993-4				37590.00	22557.00	1.67

Table 1: Major Agricultural Export, Quantity, Value and Price. Mainland China

Export items	Canned vegetables	Canned vegetables	Price	Canned fruits	Canned fruits	Price
Year/quarter	1000 dollars	Tons	1000 dols/ton	1000 dollars	Tons	1000 dols/ton
1983-1	45688.68	59412.00	0.77	9129.54	16359.00	0.56
1983-2	41590.34	54852.00	0.76	8636.13	14608.00	0.59
1983-3	46596.07	62053.00	0.75	9460.41	14129.00	0.67
1983-4	43693.78	61093.00	0.72	9807.98	15377.00	0.64
1984-1	53385.29	64555.00	0.83	9810.03	15171.00	0.65
1984-2	51369.74	60645.00	0.85	7343.82	11198.00	0.66
1984-3	45173.13	58827.00	0.77	6316.23	10152.00	0.62
1984-4	45653.80	58418.00	0.78	7613.34	12472.00	0.61
1985-1	43218.96	44717.00	0.97	6321.19	10443.00	0.61
1985-2	53119.30	59859.00	0.89	8557.89	12221.00	0.70
1985-3	50377.62	57971.00	0.87	4067.97	5764.00	0.71
1985-4	58837.50	71220.00	0.83	9122.58	12269.00	0.74
1986-1	46566.88	55702.00	0.84	8596.82	10936.00	0.79
1986-2	49275.23	62096.00	0.79	7622.62	9633.00	0.79
1986-3	64235.68	77172.00	0.83	5908.23	7672.00	0.77
1986-4	73478.49	92163.00	0.80	13274.19	19655.00	0.68
1987-1	53159.59	72586.00	0.73	10435.25	16680.00	0.63
1987-2	69212.79	81835.00	0.85	14828.05	20388.00	0.73
1987-3	78484.69	84857.00	0.92	13425.58	19207.00	0.70
1987-4	82189.68	90565.00	0.91	21507.25	31076.00	0.69
1988-1	71760.00	69948.00	1.03	11210.00	19554.00	0.57
1988-2	92130.00	86143.00	1.07	13820.00	21146.00	0.65
1988-3	88630.00	86213.00	1.03	15120.00	20486.00	0.74
1988-4	100560.00	90917.00	1.11	18580.00	26781.00	0.69
1989-1	99550.00	79989.00	1.24	10770.00	15483.00	0.70
1989-2	92170.00	79885.00	1.15	14750.00	18559.00	0.79
1989-3	90150.00	86119.00	1.05	11230.00	14614.00	0.77
1989-4	84670.00	86150.00	0.98	14960.00	22743.00	0.66
1990-1	61040.00	59366.00	1.03	11790.00	17249.00	0.68
1990-2	104220.00	95761.00	1.09	13590.00	19496.00	0.70
1990-3	93300.00	84002.00	1.11	9950.00	14373.00	0.69
1990-4	102750.00	93579.00	1.10	17920.00	26707.00	0.67
1991-1						
1991-2						
1991-3						
1991-4						
1992-1						
1992-2						
1992-3						
1992-4						
1993-1						
1993-2						
1993-3						
1993-4						

Table 1: Major Agricultural Export, Quantity, Value and Price. Mainland China

Export items	Raw silk	Raw silk	Price	Cotton	Cotton	Price
Year/quarter	1000 dollars	Tons	1000 dols/ton	1000 dollars	Tons	1000 dols/ton
1983-1	70553.00	2669.00	26.43	0.00	0.00	
1983-2	49647.71	2005.00	24.76	0.00	0.00	
1983-3	72213.82	2665.00	27.10	0.00	0.00	
1983-4	52839.82	2134.00	24.76	0.00	0.00	
1984-1	44909.89	1756.00	25.58	0.00	44083.00	0.00
1984-2	51809.35	2159.00	24.00	104090.70	75235.00	1.38
1984-3	54109.30	2287.00	23.66	68518.98	48720.00	1.41
1984-4	54675.91	2340.00	23.37	27216.19	20829.00	1.31
1985-1	45489.92	2018.00	22.54	84113.90	59436.00	1.42
1985-2	58564.91	2597.00	22.55	87410.53	71340.00	1.23
1985-3	74064.54	3133.00	23.64	119158.94	88254.00	1.35
1985-4	77241.05	3144.00	24.57	143246.75	127997.00	1.12
1986-1	38032.43	1517.00	25.07	164814.47	162563.00	1.01
1986-2	41549.52	1670.00	24.88	189612.62	216748.00	0.87
1986-3	66424.11	2641.00	25.15	120138.47	121506.00	0.99
1986-4	88174.73	3566.00	24.73	55497.31	62340.00	0.89
1987-1	45225.69	1905.00	23.74	172246.10	185332.00	0.93
1987-2	50537.35	2076.00	24.34	240204.19	254013.00	0.95
1987-3	47377.75	1889.00	25.08	231633.53	222930.00	1.04
1987-4	89895.22	3364.00	26.72	116722.19	92302.00	1.26
1988-1	52430.00	1876.00	27.95	219960.00	133636.00	1.65
1988-2	64380.00	2242.00	28.72	195780.00	127071.00	1.54
1988-3	82810.00	2459.00	33.68	177100.00	117841.00	1.50
1988-4	109060.00	2827.00	38.58	126010.00	89454.00	1.41
1989-1	88460.00	2105.00	42.02	70950.00	45395.00	1.56
1989-2	104840.00	2407.00	43.56	151320.00	93988.00	1.61
1989-3	139470.00	2977.00	46.85	181420.00	115615.00	1.57
1989-4	194160.00	3872.00	50.14	27460.00	17484.00	1.57
1990-1	49700.00	1065.00	46.67	35450.00	20336.00	1.74
1990-2	78680.00	1620.00	48.57	117410.00	64365.00	1.82
1990-3	79160.00	1680.00	47.12	121600.00	68485.00	1.78
1990-4	154580.00	3239.00	47.72	26070.00	14097.00	1.85
1991-1	53420.00	1117.00	47.82	85550.00	48972.00	1.75
1991-2	76740.00	1743.00	44.03	134630.00	73969.00	1.82
1991-3	68640.00	1663.00	41.27	88180.00	49214.00	1.79
1991-4	137790.00	3397.00	40.56	52600.00	27825.00	1.89
1992-1	53350.00	1626.00	32.81	42350.00	27867.00	1.52
1992-2	87270.00	2770.00	31.51	49300.00	33142.00	1.49
1992-3	68900.00	2122.00	32.47	58440.00	40350.00	1.45
1992-4	69190.00	2383.00	29.03	60500.00	43261.00	1.40
1993-1	21390.00	814.00	26.28	35420.00	27721.00	1.28
1993-2	31390.00	1470.00	21.35	45110.00	33461.00	1.35
1993-3	52000.00	2418.00	21.51	47100.00	37981.00	1.24
1993-4	83660.00	3965.00	21.10	62460.00	50653.00	1.23

Table 1: Major Agricultural Export, Quantity, Value and Price. Mainland China

Export items	Oilseeds, edibl	Oilseeds, edibl	Price	Peanuts	Peanuts	Price
Year/quarter	1000 dollars	Tons	1000 dols/ton	1000 dollars	Tons	1000 dols/ton
1983-1	55064.00	83680.00	0.66	40634.92	55289.00	0.73
1983-2	64972.32	107305.00	0.61	41816.81	56111.00	0.75
1983-3	46979.32	87033.00	0.54	19929.40	27245.00	0.73
1983-4	41611.93	83131.00	0.50	14123.29	17042.00	0.83
1984-1	65582.08	93684.00	0.70	43024.84	40281.00	1.07
1984-2	82512.73	111859.00	0.74	66756.13	74100.00	0.90
1984-3	36770.96	74469.00	0.49	14226.12	19245.00	0.74
1984-4	25844.89	56385.00	0.46	6451.85	9476.00	0.68
1985-1	55603.11	117360.00	0.47	35776.44	48920.00	0.73
1985-2	65021.05	123003.00	0.53	42077.19	59721.00	0.70
1985-3	47178.17	95425.00	0.49	22001.37	35404.00	0.62
1985-4	33170.73	73816.00	0.45	11713.65	19309.00	0.61
1986-1	47745.56	99255.00	0.48	34546.30	53737.00	0.64
1986-2	103848.80	197771.00	0.53	74120.59	124449.00	0.60
1986-3	47075.75	103526.00	0.45	24099.92	42737.00	0.56
1986-4	48924.73	107767.00	0.45	25115.59	41496.00	0.61
1987-1	83981.73	159055.00	0.53	60964.54	81710.00	0.75
1987-2	107753.90	185750.00	0.58	85902.74	119152.00	0.72
1987-3	46762.49	103780.00	0.45	25056.42	44329.00	0.57
1987-4	34736.70	80353.00	0.43	11687.26	22796.00	0.51
1988-1	64760.00	129642.00	0.50	44500.00	69318.00	0.64
1988-2	106800.00	195873.00	0.55	81450.00	120734.00	0.67
1988-3	58200.00	105644.00	0.55	34580.00	46080.00	0.75
1988-4	30510.00	79055.00	0.39	9680.00	15086.00	0.64
1989-1	54840.00	88624.00	0.62	41500.00	58483.00	0.71
1989-2	102020.00	156865.00	0.65	84940.00	116534.00	0.73
1989-3	56370.00	90860.00	0.62	39370.00	56631.00	0.70
1989-4	35230.00	55731.00	0.63	24150.00	34418.00	0.70
1990-1	75130.00	110448.00	0.68	62530.00	92011.00	0.68
1990-2	106950.00	162496.00	0.66	75760.00	109512.00	0.69
1990-3	84350.00	130907.00	0.64	61600.00	93096.00	0.66
1990-4	85770.00	111672.00	0.77	71220.00	92703.00	0.77
1991-1	152580.00	186614.00	0.82	126630.00	143621.00	0.88
1991-2	167920.00	186018.00	0.90	140630.00	141806.00	0.99
1991-3	65930.00	92011.00	0.72	50700.00	69542.00	0.73
1991-4	62040.00	107588.00	0.58	42320.00	72671.00	0.58
1992-1	111970.00	320000.00	0.35	46660.00	70000.00	0.67
1992-2	137270.00	520000.00	0.26	59780.00	90000.00	0.66
1992-3	96580.00	220000.00	0.44	43650.00	70000.00	0.62
1992-4	93370.00	220000.00	0.42	40230.00	70000.00	0.57
1993-1	73480.00	160000.00	0.46	41000.00	70000.00	0.59
1993-2	109940.00	260000.00	0.42	66370.00	110000.00	0.60
1993-3	92570.00	240000.00	0.39	38310.00	50000.00	0.77
1993-4	131390.00	340000.00	0.39	50480.00	90000.00	0.56

Table 1: Major Agricultural Export, Quantity, Value and Price. Mainland China

Export items	Vegetable oil	Vegetable oil	Price	Cotton yarn	Cotton yarn	Price
Year/quarter	1000 dollars	Tons	1000 dols/ton	1000 dollars	Tons	1000 dols/ton
1983-1	11469.53	23044.00	0.50	31018.95	13475.00	2.30
1983-2	20679.42	51336.00	0.40	44906.89	21456.00	2.09
1983-3	26631.37	59548.00	0.45	135012.61	37844.00	3.57
1983-4	14411.32	21730.00	0.66	86846.89	41764.00	2.08
1984-1	10652.70	14129.00	0.75	100677.06	42703.00	2.36
1984-2	25057.84	33308.00	0.75	95030.08	39838.00	2.39
1984-3	35632.04	44367.00	0.80	81001.25	39393.00	2.06
1984-4	26478.08	38962.00	0.68	91671.04	45486.00	2.02
1985-1	14099.75	19191.00	0.73	51864.17	23506.00	2.21
1985-2	12814.04	15491.00	0.83	65336.84	33802.00	1.93
1985-3	50154.48	70016.00	0.72	63642.29	33653.00	1.89
1985-4	34491.61	56920.00	0.61	112917.33	63767.00	1.77
1986-1	10757.72	16900.00	0.64	57655.13	30330.00	1.90
1986-2	16729.15	30028.00	0.56	133252.11	72751.00	1.83
1986-3	24091.77	47831.00	0.50	100730.38	53264.00	1.89
1986-4	34034.95	70964.00	0.48	133322.58	71857.00	1.86
1987-1	7055.35	12587.00	0.56	106399.79	56520.00	1.88
1987-2	8764.11	16154.00	0.54	145830.20	70188.00	2.08
1987-3	6120.37	10380.00	0.59	139500.27	59635.00	2.34
1987-4	8989.79	16539.00	0.54	143780.23	56621.00	2.54
1988-1	3900.00	6490.00	0.60	82520.00	30439.00	2.71
1988-2	4890.00	7871.00	0.62	146150.00	58999.00	2.48
1988-3	3480.00	4534.00	0.77	124170.00	50719.00	2.45
1988-4	5100.00	6608.00	0.77	158850.00	65469.00	2.43
1989-1	2580.00	3080.00	0.84	91220.00	39441.00	2.31
1989-2	3420.00	4315.00	0.79	110760.00	47384.00	2.34
1989-3	15520.00	24565.00	0.63	108590.00	46525.00	2.33
1989-4	17940.00	30139.00	0.60	113640.00	50306.00	2.26
1990-1	16200.00	25139.00	0.64	47510.00	21057.00	2.26
1990-2	38880.00	58691.00	0.66	100950.00	47570.00	2.12
1990-3	25420.00	34941.00	0.73	111180.00	49972.00	2.22
1990-4	14920.00	20706.00	0.72	130560.00	57557.00	2.27
1991-1	246970 00	24697.00	10.00	354210.00	35421.00	10.00
1991-2	34590.00	43459.00	0.80	127150.00	53240.00	2.39
1991-3	8960.00	10581.00	0.85	121350.00	48890.00	2.48
1991-4	14520.00	20597.00	0.70	130550.00	49415.00	2.64
1992-1	7230.00	9268.00	0.78	80450.00	31191.00	2.58
1992-2	11340.00	16108.00	0.70	115090.00	46696.00	2.46
1992-3	9870.00	13953.00	0.71	87890.00	36931.00	2.38
1992-4	17520.00	28517.00	0.61	107860.00	48171.00	2.24
1993-1	8950.00	14206.00	0.63	68450.00	31580.00	2.17
1993-2	23270.00	36784.00	0.63	103560.00	49779.00	2.08
1993-3	14030.00	19993.00	0.70	108430.00	39774.00	2.73
1993-4	43640.00	65611.00	0.67	135890.00	65192.00	2.08

Table 2: Major Agricultural Imports, Quantity, Value and Price, Mainland China

Import items	Food grain	Food grain	Price	Wheat	Wheat	Price
Year/quarter	1000 dollars	1,000 tons	dollars/ton	1000 dollars	1,000 tons	dollars/ton
1983-1	674280.59	3510.00	192.10	517926.27	2570.00	201.53
1983-2	757935.83	3800.00	199.46	588395.72	2840.00	207.18
1983-3	610146.24	3480.00	175.33	550736.26	3130.00	175.95
1983-4	475325.92	2730.00	174.11	449034.87	2660.00	168.81
1984-1	530379.93	2950.00	179.79	506210.42	2830.00	178.87
1984-2	397515.04	2340.00	169.88	371281.81	2230.00	166.49
1984-3	382853.57	2390.00	160.19	347526.07	2220.00	156.54
1984-4	434541.03	2730.00	159.17	407092.54	2590.00	157.18
1985-1	344124.51	1940.00	177.38	304771.84	1750.00	174.16
1985-2	229880.70	1420.00	161.89	204200.00	1250.00	163.36
1985-3	188475.80	1180.00	159.73	170683.14	1080.00	158.04
1985-4	227871.40	1430.00	159.35	199857.46	1290.00	154.93
1986-1	271281.57	1840.00	147.44	223367.63	1610.00	138.74
1986-2	411433.93	2840.00	144.87	309028.43	2230.00	138.58
1986-3	247958.19	1800.00	137.75	194040.18	1440.00	134.75
1986-4	152290.32	1240.00	122.81	102276.88	840.00	121.76
1987-1	272923.16	2270.00	120.23	177337.45	1600.00	110.84
1987-2	484935.52	4470.00	108.49	367732.40	3450.00	106.59
1987-3	500720.04	4750.00	105.41	384134.87	3770.00	101.89
1987-4	497173.56	4790.00	103.79	434873.72	4380.00	99.29
1988-1	302480.00	2700.00	112.03	247530.00	2380.00	104.00
1988-2	465950.00	3980.00	117.07	431010.00	3800.00	113.42
1988-3	559280.00	4740.00	117.99	533120.00	4630.00	115.14
1988-4	567840.00	3910.00	145.23	519380.00	3730.00	139.24
1989-1	485360.00	2820.00	172.11	394240.00	2450.00	160.91
1989-2	1078780.00	5910.00	182.53	910560.00	5260.00	173.11
1989-3	726050.00	3940.00	184.28	623080.00	3510.00	177.52
1989-4	700510.00	3910.00	179.16	653320.00	3660.00	178.50
1990-1	528870.00	2980.00	177.47	481070.00	2650.00	181.54
1990-2	803960.00	4430.00	181.48	728950.00	3990.00	182.69
1990-3	539570.00	3210.00	168.09	510900.00	3060.00	166.96
1990-4	480450.00	3100.00	154.98	435620.00	2830.00	153.93
1991-1	184740.00	1340.00	137.87	161300.00	1210.00	133.31
1991-2	409270.00	3260.00	125.54	354680.00	2900.00	122.30
1991-3	377980.00	3130.00	120.76	346770.00	2950.00	117.55
1991-4	670760.00	5730.00	117 06	596790.00	5300.00	112.60
1992-1	449820.00	3370.00	133.48	401830.00	3120.00	128.79
1992-2	640860.00	4290.00	149.38	565390.00	3880.00	145.72
1992-3	319030.00	2070.00	154.12	296860.00	1970.00	150.69
1992-4	295320.00	1890.00	156.25	239640.00	1620.00	147.93
1993-1	206450.00	1430.00	144.37	173770.00	1260.00	137.91
1993-2	263590.00	1900.00	138.73	229560.00	1740.00	131.93
1993-3	357670.00	2630.00	136.00	306730.00	2340.00	131.08
1993-4	177280.00	1380.00	128.46	124010.00	1090.00	113.77

Table 2: Major Agricultural Imports, Quantity, Value and Price, Mainland China

Import items	Sugar	Sugar	Price	Natural rubber	Natural rubber	Price
Year/quarter	1000 dollars	Tons	1000 dols/ton	1000 dollars	Tons	1000 dols/ton
1983-1	129871.99	466949.00	0.28	46169.99	57090.00	0.81
1983-2	184978.61	786668.00	0.24	55973.26	53229.00	1.05
1983-3	89369.64	394966.00	0.23	54044.38	45963.00	1.18
1983-4	46664.98	185478.00	0.25	91430.02	83571.00	1.09
1984-1	51904.53	233162.00	0.22	40248.42	36502.00	1.10
1984-2	77880.61	351635.00	0.22	59250.35	55138.00	1.07
1984-3	65173.13	327164.00	0.20	51606.17	58165.00	0.89
1984-4	52877.48	318733.00	0.17	94185.09	65861.00	1.43
1985-1	39667.49	266231.00	0.15	22076.41	27351.00	0.81
1985-2	94038.60	607582.00	0.15	32185.96	40715.00	0.79
1985-3	79337.45	593622.00	0.13	32790.94	35662.00	0.92
1985-4	68717.14	441286.00	0.16	42888.82	59586.00	0.72
1986-1	35073.28	233414.00	0.15	26984.72	37542.00	0.72
1986-2	47791.32	235983.00	0.20	55101.53	70264.00	0.78
1986-3	77056.75	344493.00	0.22	29690.47	38047.00	0.78
1986-4	60088.71	368601.00	0.16	54021.51	65176.00	0.83
1987-1	16859.22	119757.00	0.14	56931.76	66791.00	0.85
1987-2	79881.78	486635.00	0.16	63027.94	71501.00	0.88
1987-3	102063.41	622703.00	0.16	69779.69	76703.00	0.91
1987-4	98648.58	597719.00	0.17	136937.13	134039.00	1.02
1988-1	66240.00	361957.00	0.18	129740.00	121864.00	1.06
1988-2	195180.00	915088.00	0.21	109660.00	93914.00	1.17
1988-3	303260.00	1316764.00	0.23	68370.00	54280.00	1.26
1988-4	293550.00	1115129.00	0.26	121260.00	92092.00	1.32
1989-1	89690.00	322926.00	0.28	50570.00	48384.00	1.05
1989-2	179700.00	686388.00	0.26	95690.00	88327.00	1.08
1989-3	85530.00	311744.00	0.27	102930.00	108886.00	0.95
1989-4	74860.00	259577.00	0.29	127280.00	140241.00	0.91
1990-1	60200.00	172173.00	0.35	68840.00	79610.00	0.86
1990-2	149610.00	427657.00	0.35	58510.00	68796.00	0.85
1990-3	76130.00	226813.00	0.34	62340.00	73710.00	0.85
1990-4	92860.00	305479.00	0.30	95850.00	113297.00	0.85
1991-1	73920.00	271480.00	0.27	75980.00	88783.00	0.86
1991-2	62360.00	249743.00	0.25	73230.00	87145.00	0.84
1991-3	55240.00	223042.00	0.25	39360.00	45783.00	0.86
1991-4	64740.00	269498.00	0.24	72670.00	84449.00	0.86
1992-1	59380.00	220000.00	0.27	63160.00	80000.00	0.79
1992-2	104640.00	460000.00	0.23	63530.00	80000.00	0.79
1992-3	57710.00	270000.00	0.21	40720.00	50000.00	0.81
1992-4	33580.00	140000.00	0.24	63430.00	70000.00	0.91
1993-1	8940.00	30000.00	0.30	63390.00	80000.00	0.79
1993-2	55020.00	210000.00	0.26	39330.00	40000.00	0.98
1993-3	26160.00	110000.00	0.24	35340.00	40000.00	0.88
1993-4	20820.00	90000.00	0.23	81760.00	110000.00	0.74

Table 2: Major Agricultural Imports, Quantity, Value and Price, Mainland China

Import items	Logs	Logs	Price	Cotton	Cotton	Price
Year/quarter	1000 dollars	1000 cubic mtr	dols/cubic mtr	1000 dollars	Tons	1000 dols/ton
1983-1	108115.72	1170.00	92.41	47793.14	32907.00	1 45
1983-2	118705.88	1330.00	89.25	55967.91	40217.00	1.39
1983-3	137266.77	1680.00	81.71	126888.55	102815.00	1.23
1983-4	191051.04	2130.00	89.70	102935.83	54216.00	1.90
1984-1	156731.61	1820.00	86.12	22328.30	15396.00	1.45
1984-2	145941.69	176.00	829.21	5627.02	3367.00	1.67
1984-3	176103.46	207.00	850.74	23516.90	8065.00	2.92
1984-4	175605.10	224.00	783.95	22660.17	12946.00	1.75
1985-1	135925.01	1710.00	79.49	7.07	12.00	0.59
1985-2	180722.81	2270.00	79.61	59.65	60.00	0.99
1985-3	227796.09	2690.00	84.68	30.90	38.00	0.81
1985-4	267190.37	3030.00	88.18	34.84	53.00	0.66
1986-1	153074.52	1930.00	79.31	12.47	18.00	0.69
1986-2	180552.95	2260.00	79.89	18.74	32.00	0.59
1986-3	124792.29	1380.00	90.43	114.04	129.00	0.88
1986-4	154666.67	159.00	972.75	5.38	8.00	0.67
1987-1	95064.48	1150.00	82.66	0.00	0.00	
1987-2	80959.16	1200.00	67.47	7799.57	3185.00	2.45
1987-3	117393.87	1620.00	72.47	3852.77	2390.00	1.61
1987-4	130067.17	1650.00	78.83	1136.49	401.00	2.83
1988-1	198410.00	2100.00	94.48	8490.00	4805.00	1.77
1988-2	209730.00	2280.00	91.99	20800.00	11164.00	1.86
1988-3	273780.00	2640.00	103.70	3930.00	2436.00	1.61
1988-4	264960.00	2650.00	99.98	25630.00	16369.00	1.57
1989-1	143170.00	1480.00	96.74	40080.00	31996.00	1.25
1989-2	186210.00	2020.00	92.18	237800.00	179835.00	1.32
1989-3	105850.00	1090.00	97.11	274490.00	206790.00	1.33
1989-4	154330.00	1380.00	111.83	156340.00	100418.00	1.56
1990-1	58940.00	620.00	95.06	97550.00	56822.00	1 72
1990-2	108390.00	1080.00	100.36	172750.00	99603.00	1 73
1990-3	124320.00	1060.00	117.28	177560.00	104930.00	1 69
1990-4	168920.00	1380.00	122.41	262930.00	155379.00	1.69
1991-1	97640.00	820.00	119.07	111780.00	63726.00	1 75
1991-2	108160.00	960.00	112.67	228120.00	132537.00	1.72
1991-3	110540.00	980.00	112.80	192000.00	114787.00	1.67
1991-4	137970.00	1200.00	114.98	98760.00	59473.00	1.66
1992-1	108380.00	860.00	126.02	130000.00	80000.00	1.63
1992-2	94970 00	1120.00	84 79	196310.00	120000.00	1.64
1992-3	123030.00	1160.00	106.06	85220.00	60000.00	1 42
1992-4	169160.00	1540.00	109.84	17340.00	10000.00	1 73
1993-1	95120.00	880.00	108.09	4730.00	0.00	
1993-2	93230.00	680.00	137 10	3610.00	0.00	
1993-3	130760.00	900.00	145.29	1750.00	0.00	
1993-4	140040.00	1000.00	140.04	5910.00	0.00	

Table 2: Major Agricultural Imports, Quantity, Value and Price, Mainland China

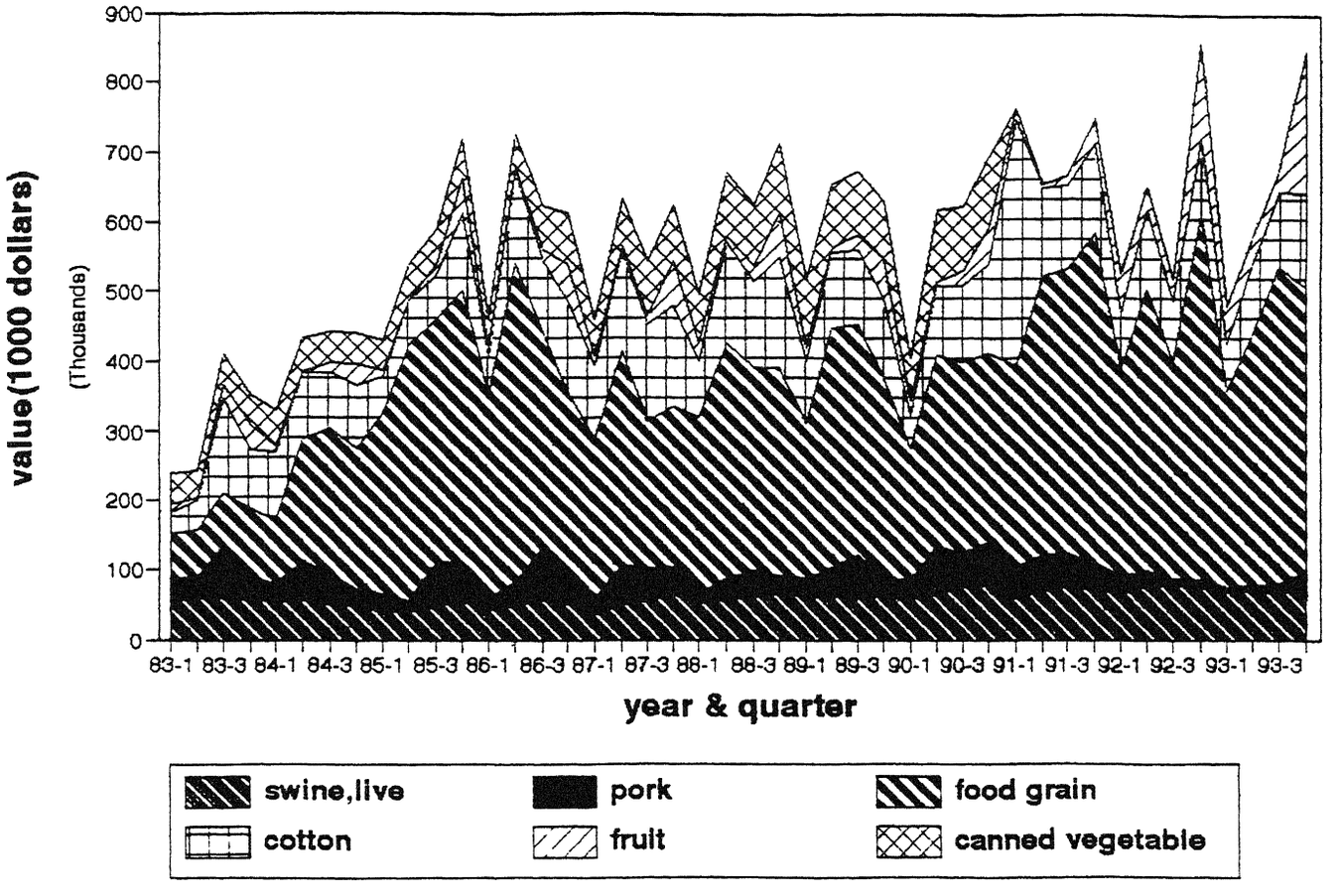
Import items	Wool	Wool	Price	Fertilizer, manufactured		Price
Year/quarter	1000 dollars	Tons	1000 dols/ton	1000 dollars	Tons	1000 dols/ton
1983-1	130496.67	42677.00	3.06	353343.57	1741766.00	0.20
1983-2	66427.81	21937.00	3.03	420299.47	2227755.00	0.19
1983-3	27463.44	32448.00	0.85	275078.16	1736927.00	0.16
1983-4	42258.72	13323.00	3.17	370985.35	2288862.00	0.16
1984-1	46444.23	16052.00	2.89	324802.73	1932222.00	0.17
1984-2	57834.34	22486.00	2.57	331952.80	2035915.00	0.16
1984-3	30550.69	11337.00	2.69	425298.29	2530480.00	0.17
1984-4	17766.95	5876.00	3.02	508104.16	2718642.00	0.19
1985-1	53335.69	18740.00	2.85	496529.89	2457978.00	0.20
1985-2	105638.60	35176.00	3.00	460712.28	2224043.00	0.21
1985-3	110957.78	35821.00	3.10	319313.42	1675732.00	0.19
1985-4	78286.35	23638.00	3.31	222049.41	1251643.00	0.18
1986-1	97758.03	29999.00	3.26	104711.57	662615.00	0.16
1986-2	105432.68	33843.00	3.12	159962.51	1097803.00	0.15
1986-3	126809.67	39259.00	3.23	225547.11	1608780.00	0.14
1986-4	158666.67	49104.00	3.23	227271.51	1913735.00	0.12
1987-1	130814.08	41594.00	3.15	269113.38	2070170.00	0.13
1987-2	164575.50	48623.00	3.38	323705.00	2628682.00	0.12
1987-3	120572.27	32078.00	3.76	319073.08	2611409.00	0.12
1987-4	127178.94	30208.00	4.21	491152.61	3608132.00	0.14
1988-1	228370.00	51206.00	4.46	402040.00	2751020.00	0.15
1988-2	191720.00	41835.00	4.58	519800.00	3441757.00	0.15
1988-3	222190.00	46413.00	4.79	691260.00	4200192.00	0.16
1988-4	253120.00	47892.00	5.29	722400.00	4313356.00	0.17
1989-1	183770.00	36609.00	5.02	507080.00	2784239.00	0.18
1989-2	179680.00	33980.00	5.29	577510.00	3314533.00	0.17
1989-3	104310.00	20145.00	5.18	687360.00	3908203.00	0.18
1989-4	67160 00	13654.00	4.92	591700.00	3926038.00	0.15
1990-1	34450.00	7593.00	4 54	434480.00	2832394.00	0.15
1990-2	43650.00	8843.00	4.94	676800.00	4241541.00	0.16
1990-3	30020.00	6865.00	4.37	812490.00	5050160.00	0.16
1990-4	37940.00	10028.00	3.78	681340.00	4151850.00	0.16
1991-1	29830.00	8024.00	3.72	724630.00	4025395.00	0.18
1991-2	57860.00	18902.00	3.06	851060.00	4700302.00	0.18
1991-3	89180.00	27477.00	3.25	886700.00	4946580.00	0.18
1991-4	174200.00	51840.00	3.36	767100.00	4502911.00	0.17
1992-1				841810.00	5070000.00	0.17
1992-2				806490.00	4990000.00	0.16
1992-3				775410.00	4780000.00	0.16
1992-4				579360.00	3740000.00	0.15
1993-1				393070.00	2680000.00	0.15
1993-2				388770.00	2640000.00	0.15
1993-3				348200.00	2460000.00	0.14
1993-4				344660.00	2420000.00	0.14

Table 2: Major Agricultural Imports, Quantity, Value and Price, Mainland China

Import items	Edible vegetable oil		Price	Other vegetable oil		Price
Year/quarter	1000 dollars	Tons	1000 dols/ton	1000 dollars	Tons	1000 dols/ton
1983-1	4490.53	5861.00	0.77	2596.01	5869.00	0.44
1983-2	4417.11	7409.00	0.60	11631.02	23442.00	0.50
1983-3	15007.56	20617.00	0.73	9899.14	18333.00	0.54
1983-4	879.23	1142.00	0.77	4072.76	7068.00	0.58
1984-1	5138.82	10898.00	0.47	5859.72	8159.00	0.72
1984-2	1633.50	1880.00	0.87	9421.56	12299.00	0.77
1984-3	809.35	753.00	1.07	12102.63	14145.00	0.86
1984-4	850.51	830.00	1.02	17145.00	23970.00	0.72
1985-1	6795.19	10629.00	0.64	10519.99	12943.00	0.81
1985-2	877.19	823.00	1.07	12161.40	15401.00	0.79
1985-3	741.50	780.00	0.95	8990.73	12752.00	0.71
1985-4	13192.90	22545.00	0.59	34048.15	68444.00	0.50
1986-1	10979.11	20954.00	0.52	11743.06	23534.00	0.50
1986-2	28047.49	55835.00	0.50	19375.20	45460.00	0.43
1986-3	7586.21	19027.00	0.40	2777.36	81087.00	0.03
1986-4	36940.86	102164.00	0.36	38879.03	122073.00	0.32
1987-1	35596.45	97442.00	0.37	19793.12	53708.00	0.37
1987-2	32281.03	75837.00	0.43	12307.90	37980.00	0.32
1987-3	78151.53	213240.00	0.37	39908.65	102003.00	0.39
1987-4	42238.04	134909.00	0.31	55741.54	134592.00	0.41
1988-1	18270.00	45009.00	0.41	30030.00	72775.00	0.41
1988-2	7570.00	18064.00	0.42	56970.00	126496.00	0.45
1988-3	21580.00	48144.00	0.45	40540.00	86414.00	0.47
1988-4	47400.00	102504.00	0.46	100820.00	194450.00	0.52
1989-1	61720.00	129811.00	0.48	41430.00	84116.00	0.49
1989-2	115650 00	238738.00	0 48	87080.00	189796.00	0.46
1989-3	116890.00	247166.00	0.47	81380.00	185533.00	0.44
1989-4	204050.00	440441.00	0.46	131230.00	322495.00	0.41
1990-1	117290.00	248468.00	0.47	66390.00	176343.00	0.38
1990-2	96620.00	203217.00	0.48	72080.00	200483.00	0.36
1990-3	122360.00	264444.00	0.46	118490.00	337576.00	0.35
1990-4	192010.00	406704.00	0.47	162090.00	475290.00	0.34
1991-1	62930.00	127843.00	0.49	67160.00	180894.00	0.37
1991-2	27900.00	62496.00	0.45	107720.00	282283.00	0.38
1991-3	113270.00	237574.00	0.48	121560.00	327174.00	0.37
1991-4	85000.00	183974.00	0.46	104700.00	301383.00	0.35
1992-1	39840.00	80000.00	0.50	28370.00	70000.00	0.41
1992-2	54690.00	120000.00	0.46	53020.00	130000.00	0.41
1992-3	56670.00	130000.00	0.44	77820.00	190000.00	0.41
1992-4	43810.00	90000.00	0.49	99040.00	250000.00	0.40
1993-1	33560.00	70000.00	0.48	33580.00	80000.00	0.42
1993-2	17790.00	30000.00	0.59	66480.00	160000.00	0.42
1993-3	25740.00	50000.00	0.51	90360.00	220000.00	0.41
1993-4	41200.00	70000.00	0.59	147790.00	380000.00	0.39

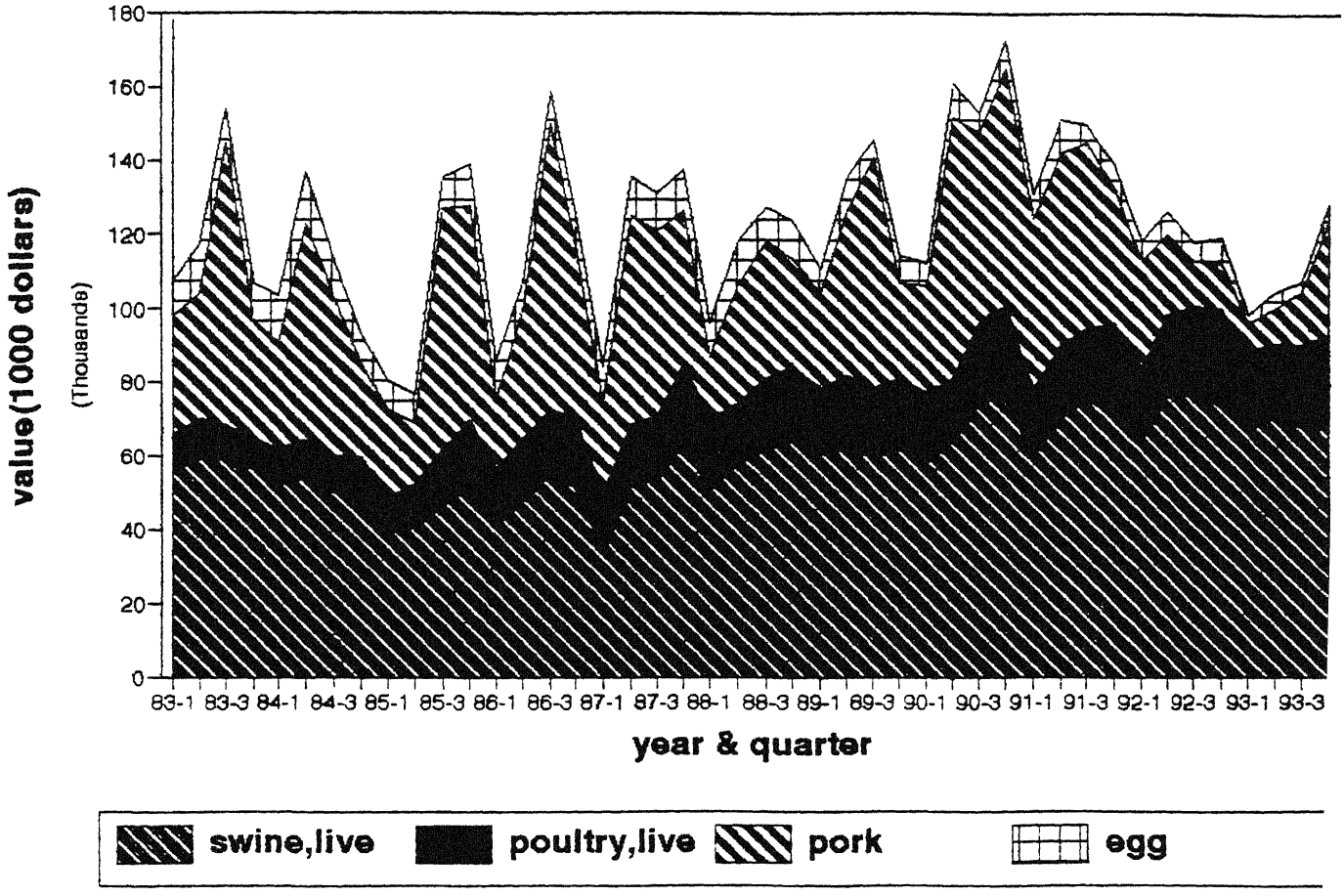
Major Agricultural Exports, Value

Mainland China, 1983-1993(by quarter)



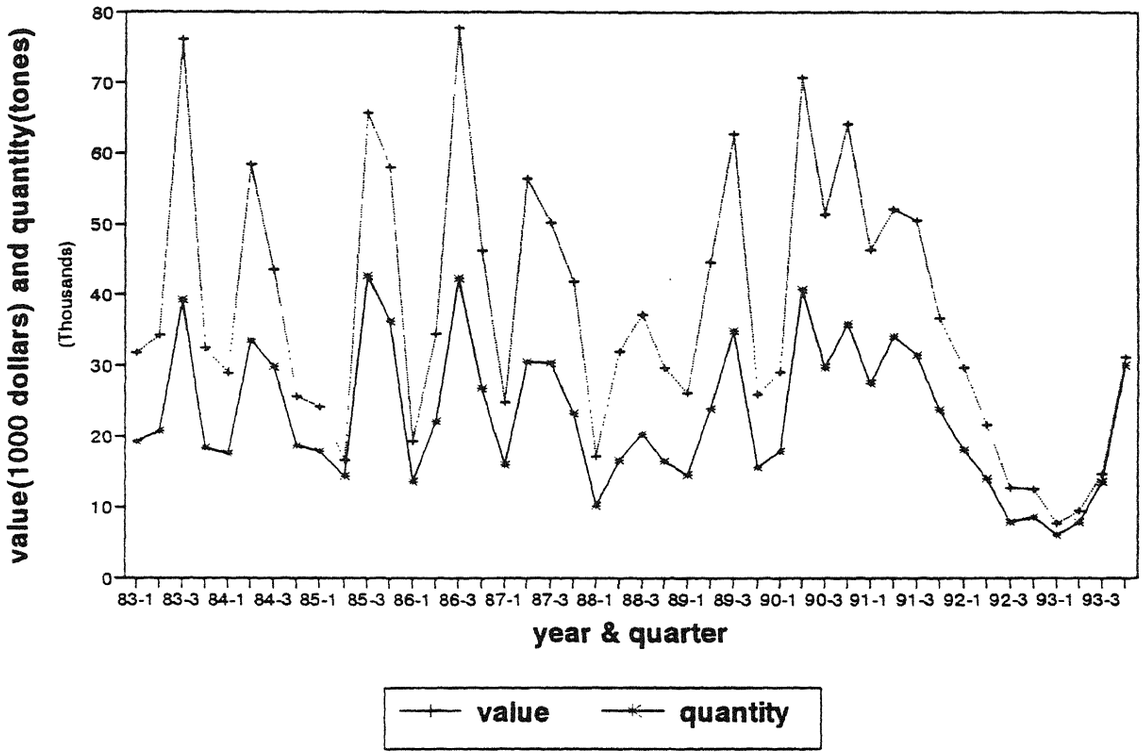
Major Animal Exports, Value

Mainland China, 1983-1993(by quarter)



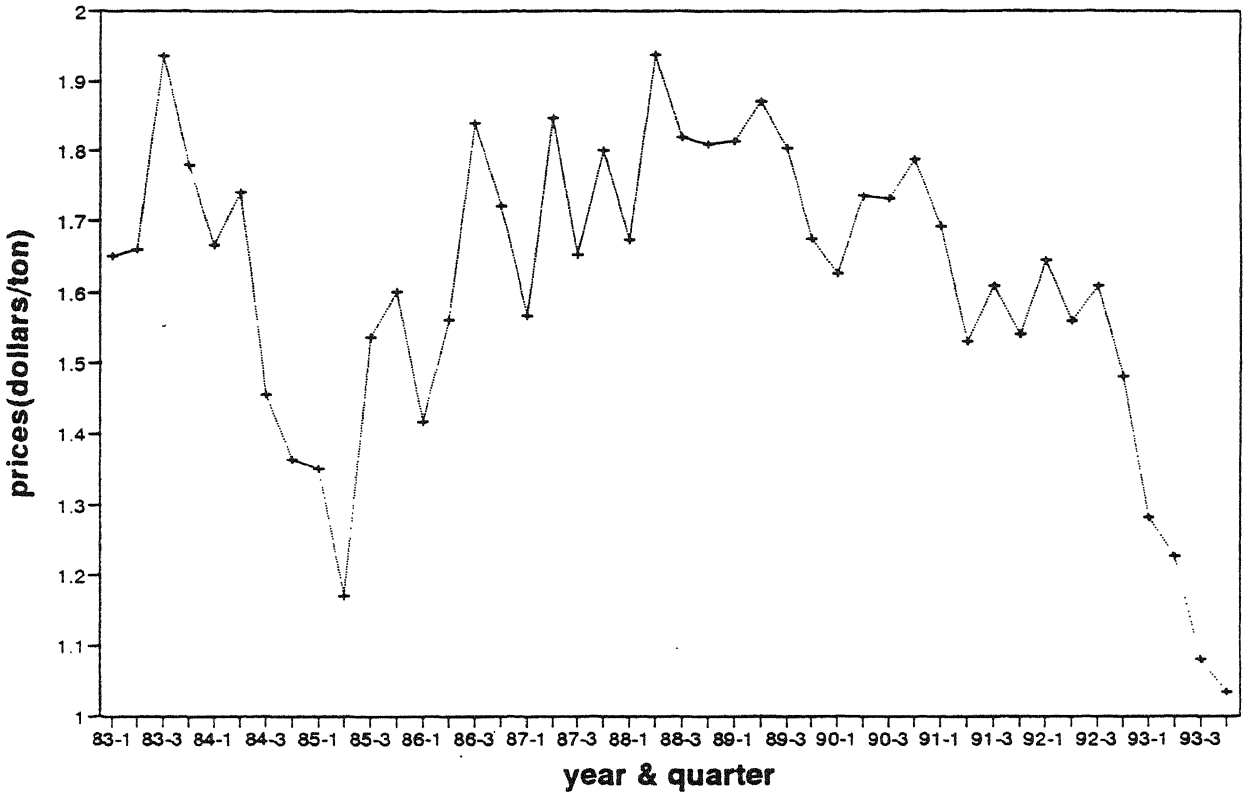
Pork Export, Value and Quantity

Mainland China, 1983-1993(by quarter)



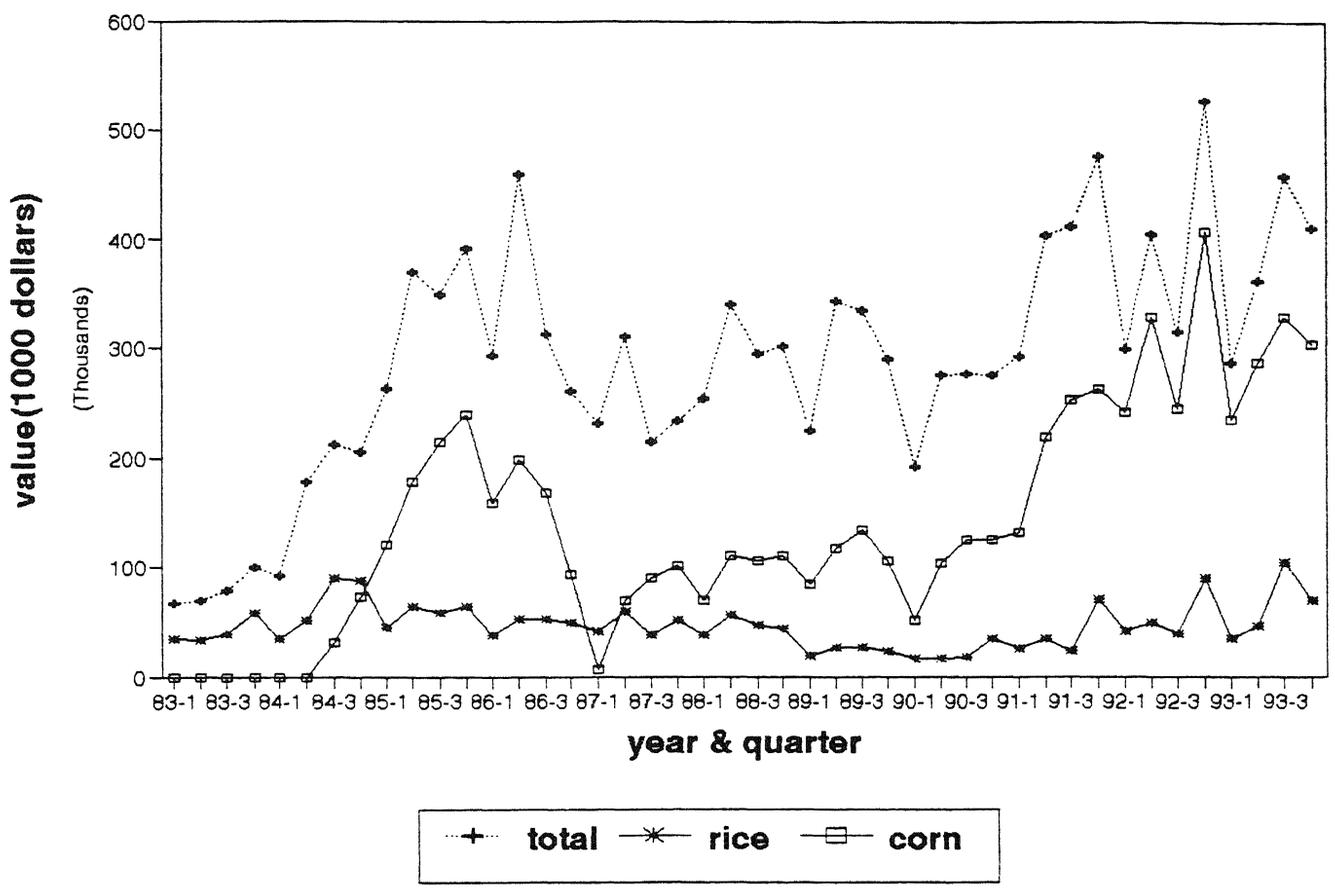
Pork Export, Prices

Mainland China, 1983-1993(by quarter)



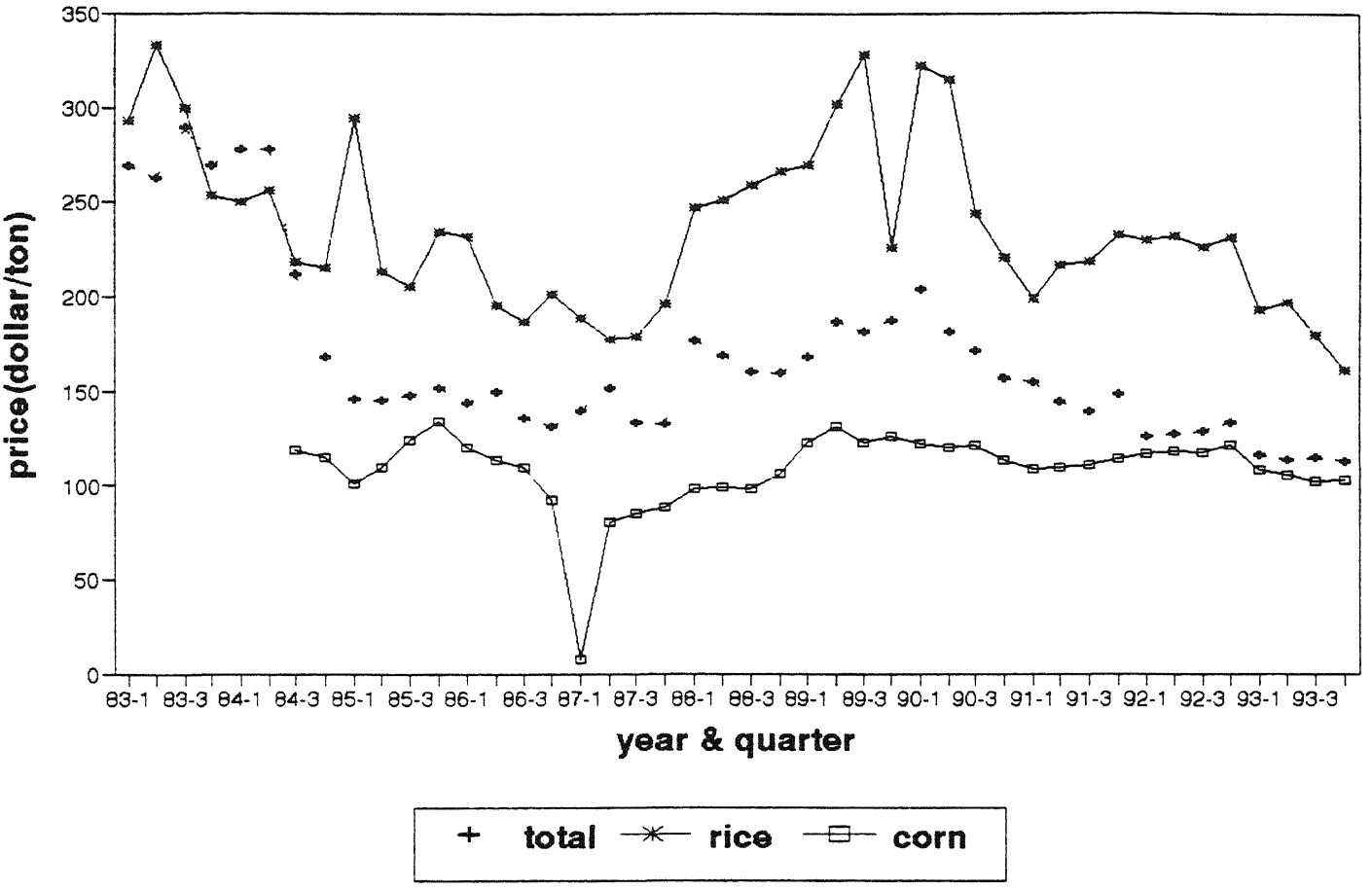
Grain Export, Value

Mainland China, 1983-1993(by quarter)



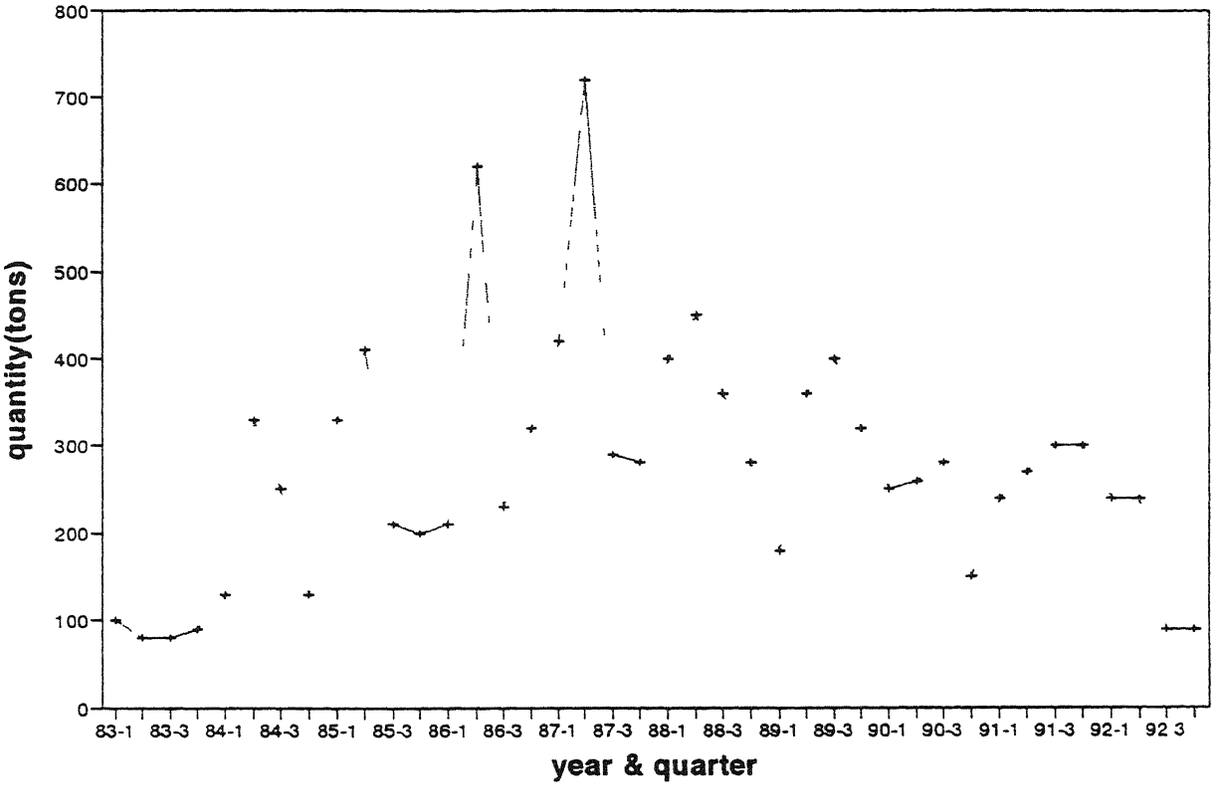
Grain Export, Price

Mainland China, 1983-1993(by quarter)



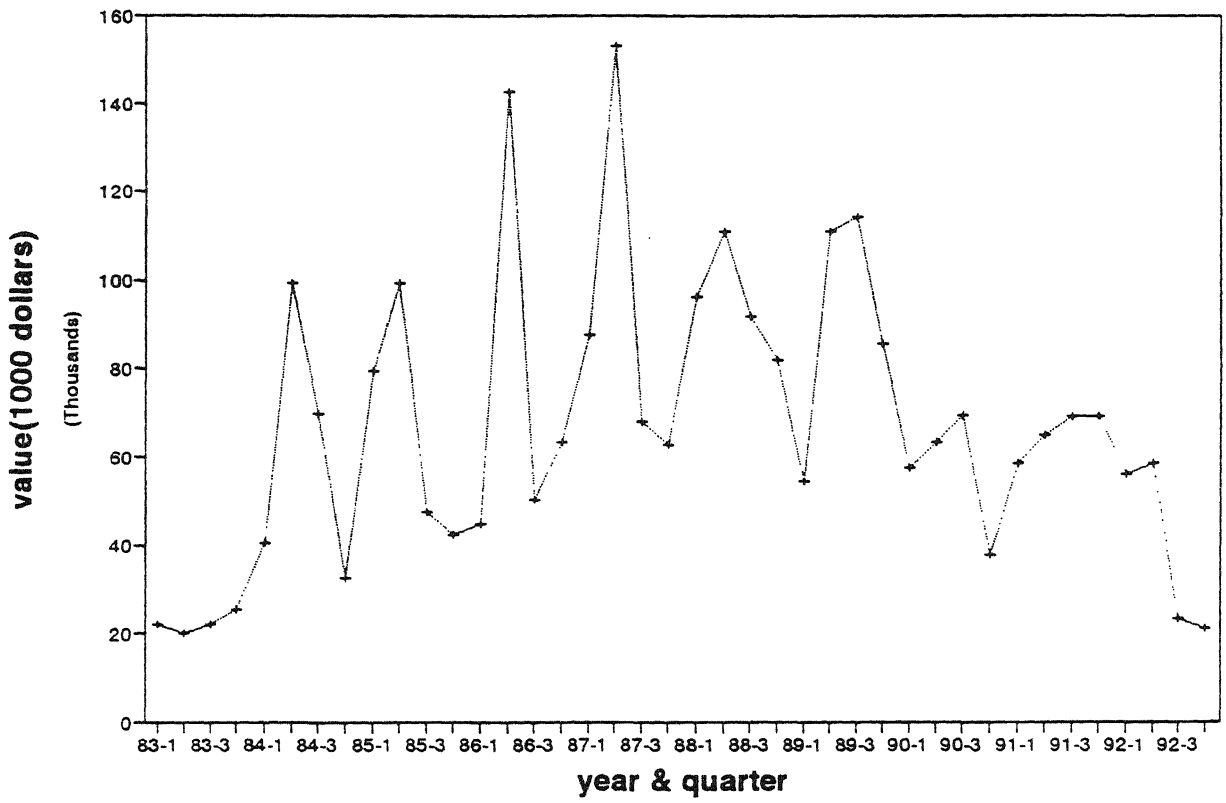
Soybean Export, Quantity

Mainland China, 1983-1992(by quarter)



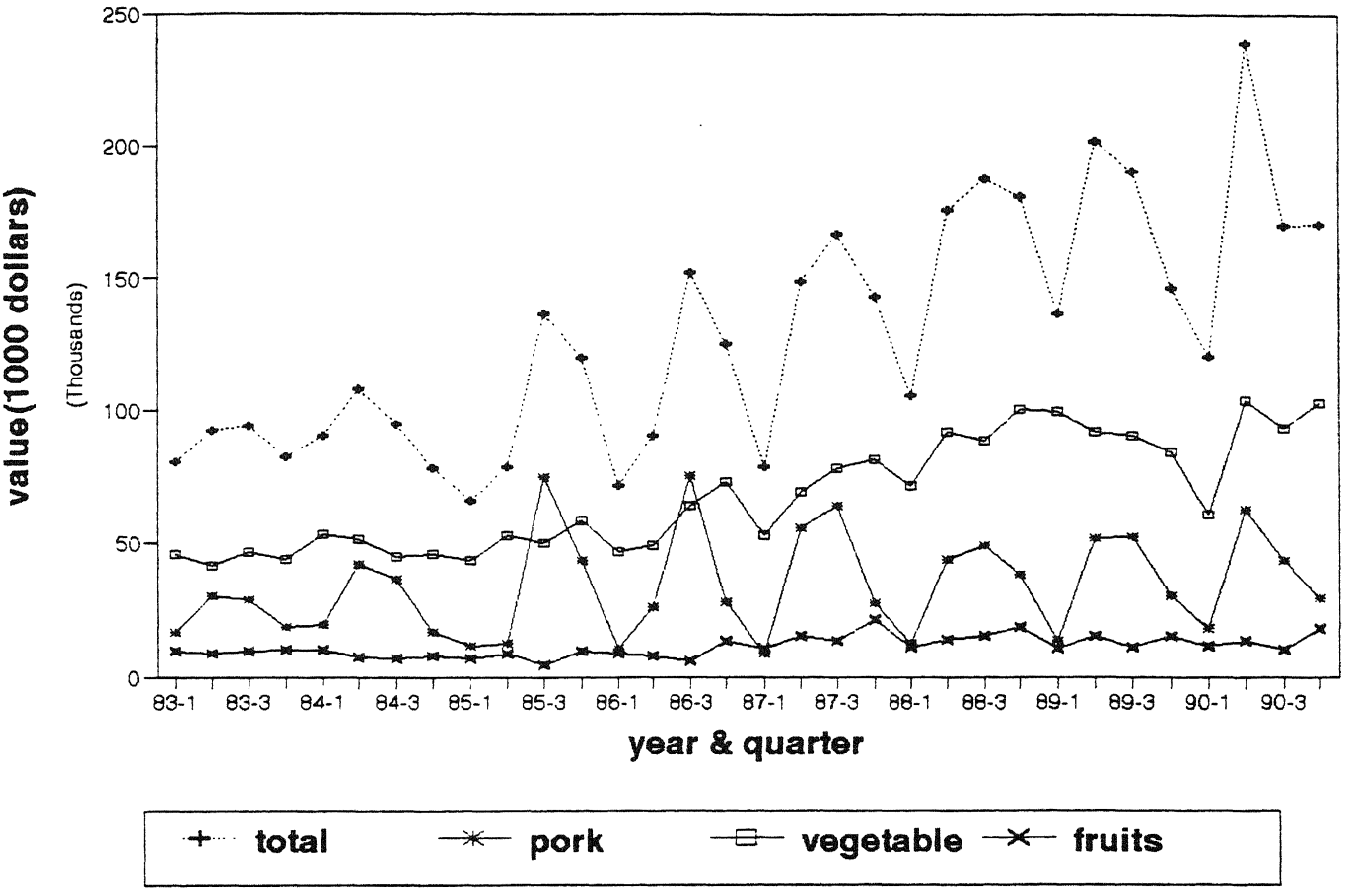
Soybean Export, Value

Mainland China, 1983-1992(by quarter)



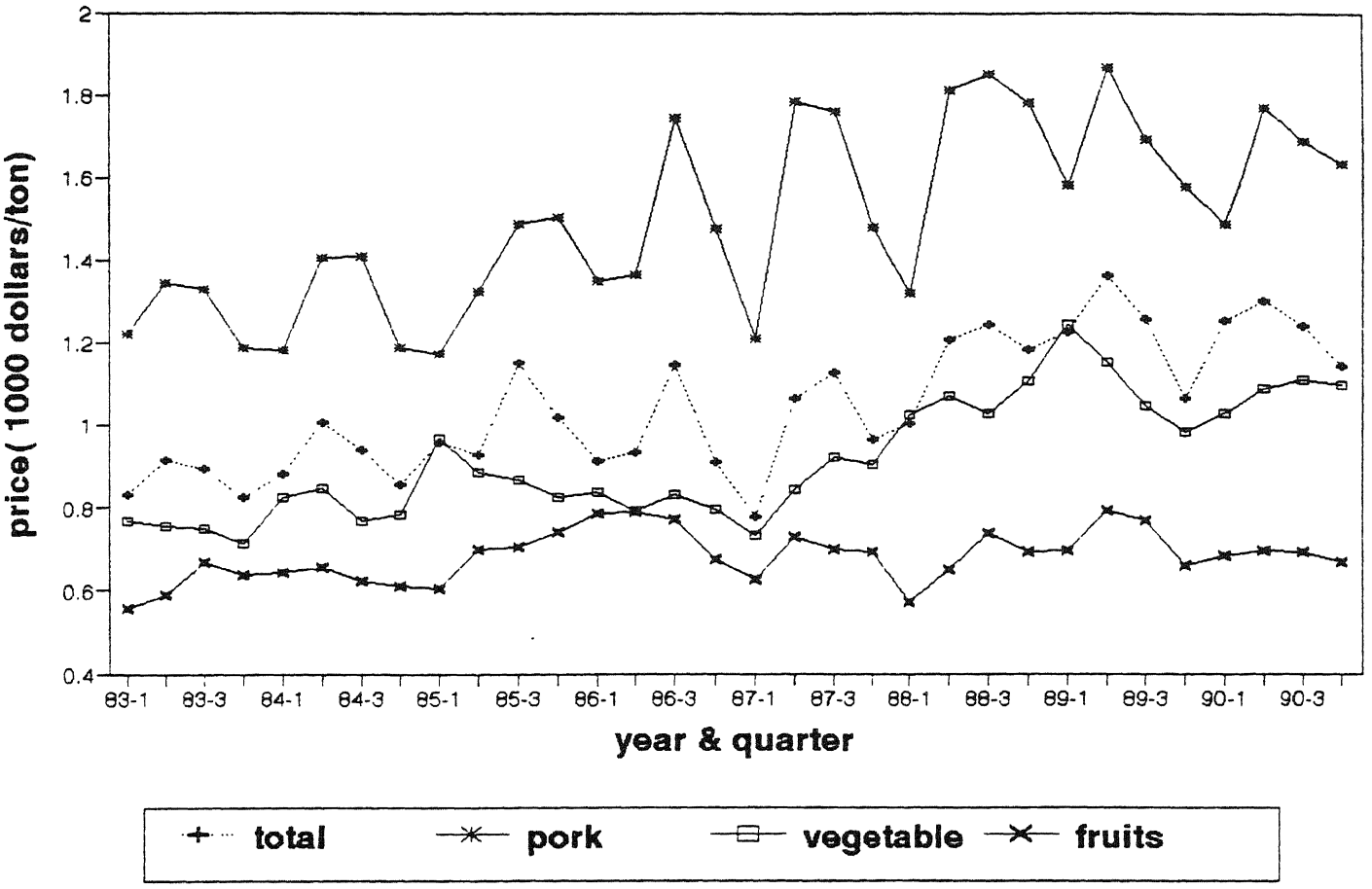
Canned Food Export, Value

Mainland China, 1983-1990(by quarter)



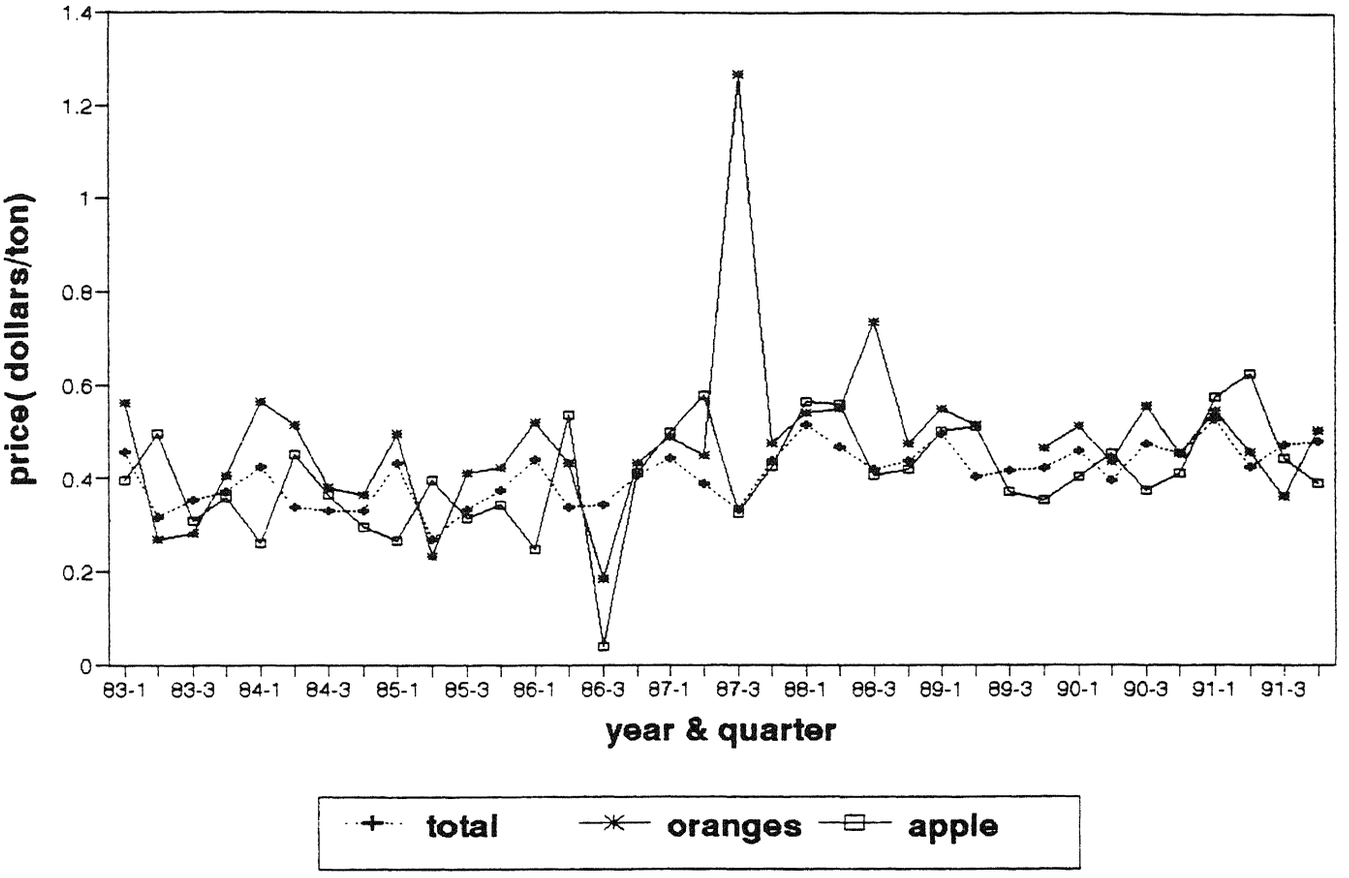
Canned Food Export, Prices

Mainland China, 1983-1990(by quarter)



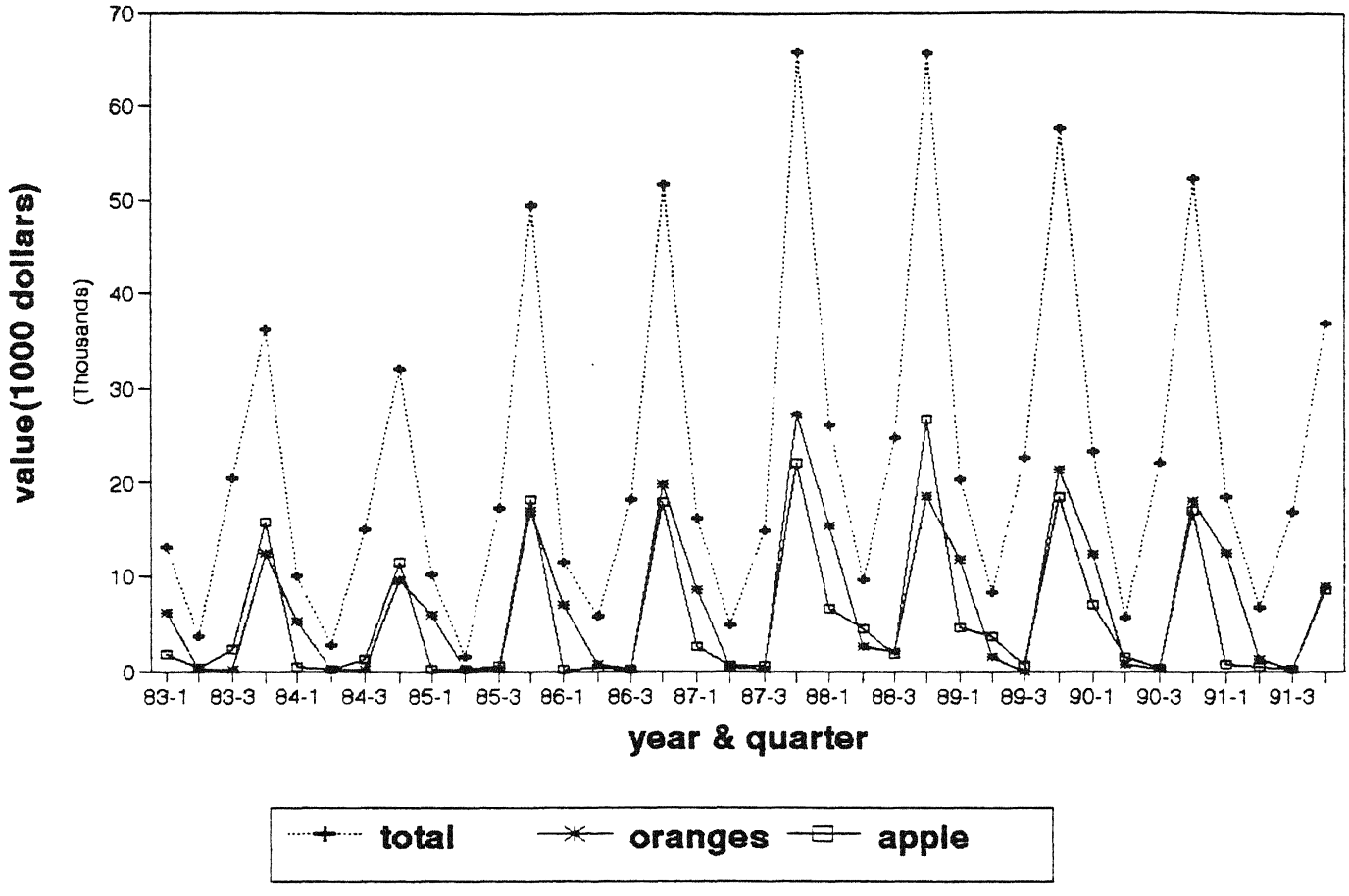
Fruit Export, Prices

Mainland China, 1983-1991(by quarter)

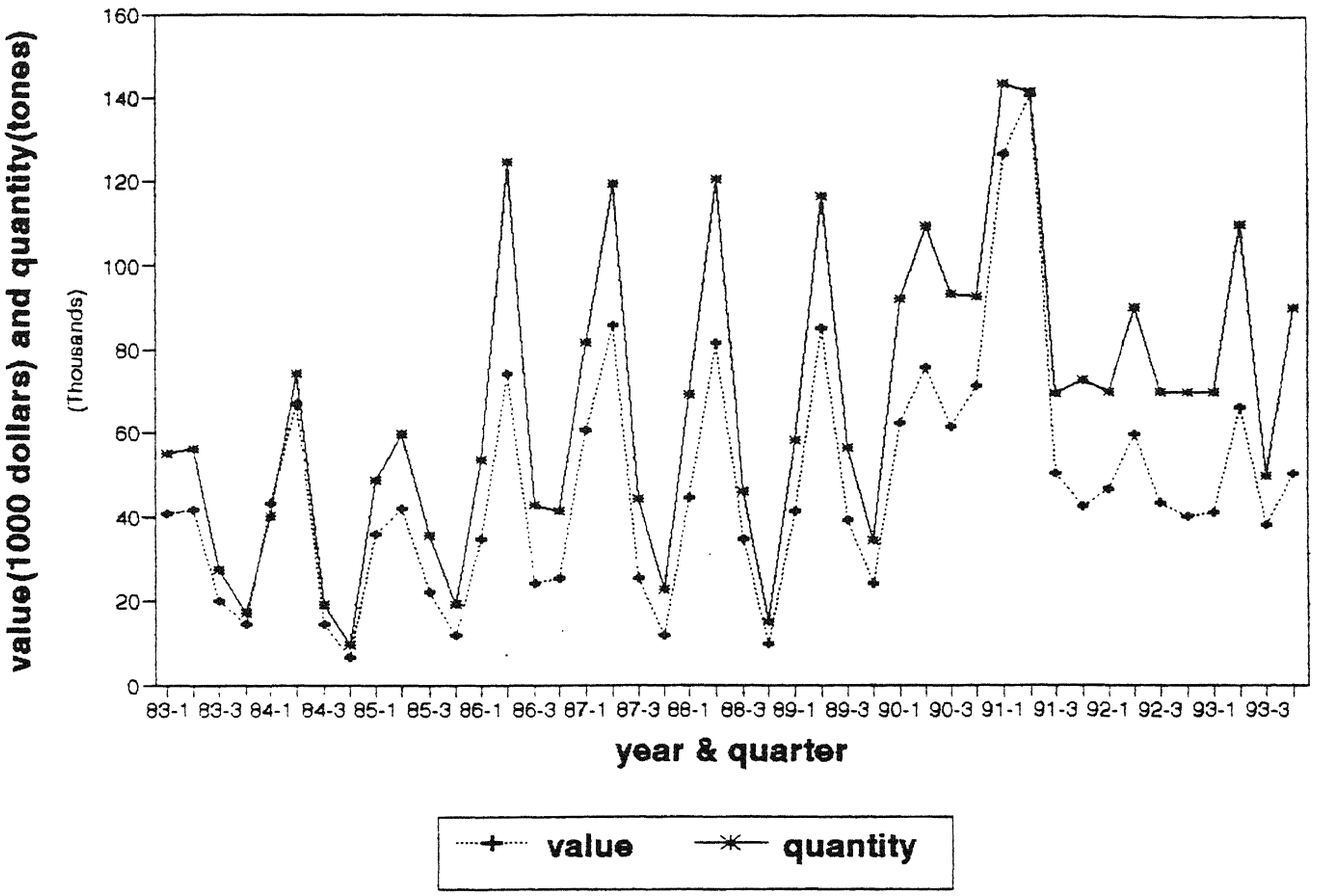


Fruit Export, Value

Mainland China, 1983-1991(by quarter)

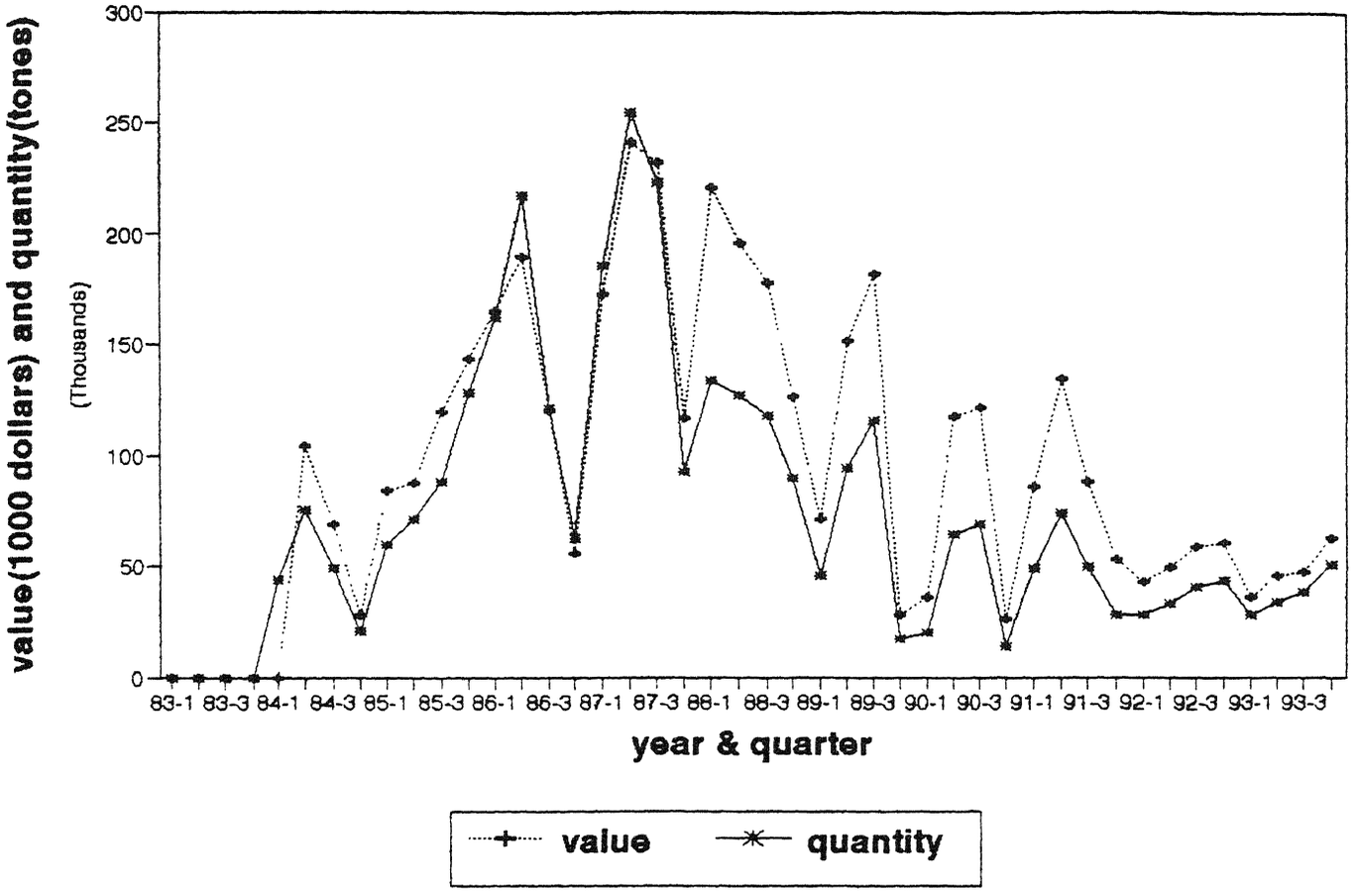


Peanut Export, Value and Quantity
Mainland China, 1983-1993(by quarter)



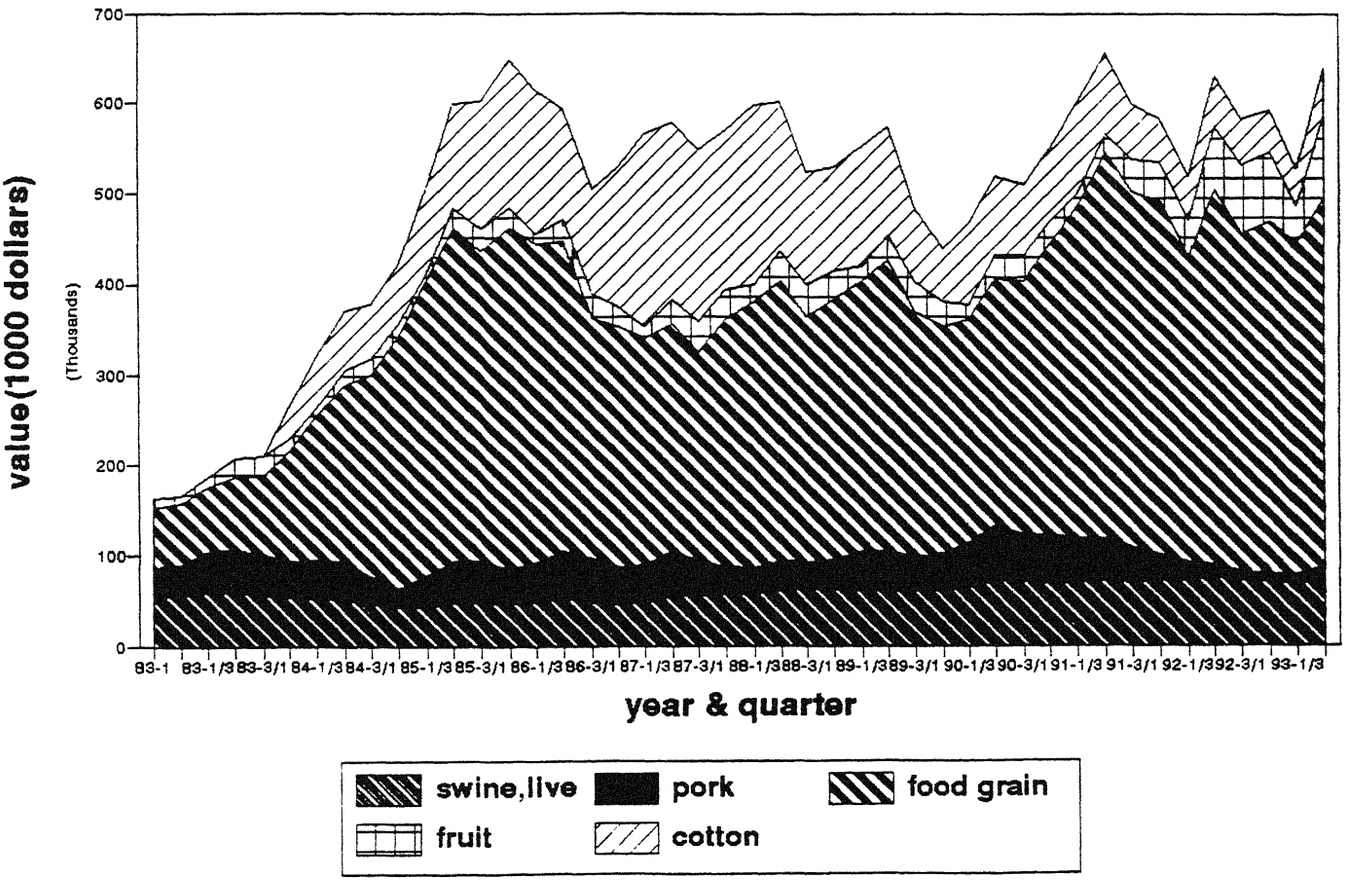
Cotton Export, Value and Quantity

Mainland China, 1983-1993(by quarter)



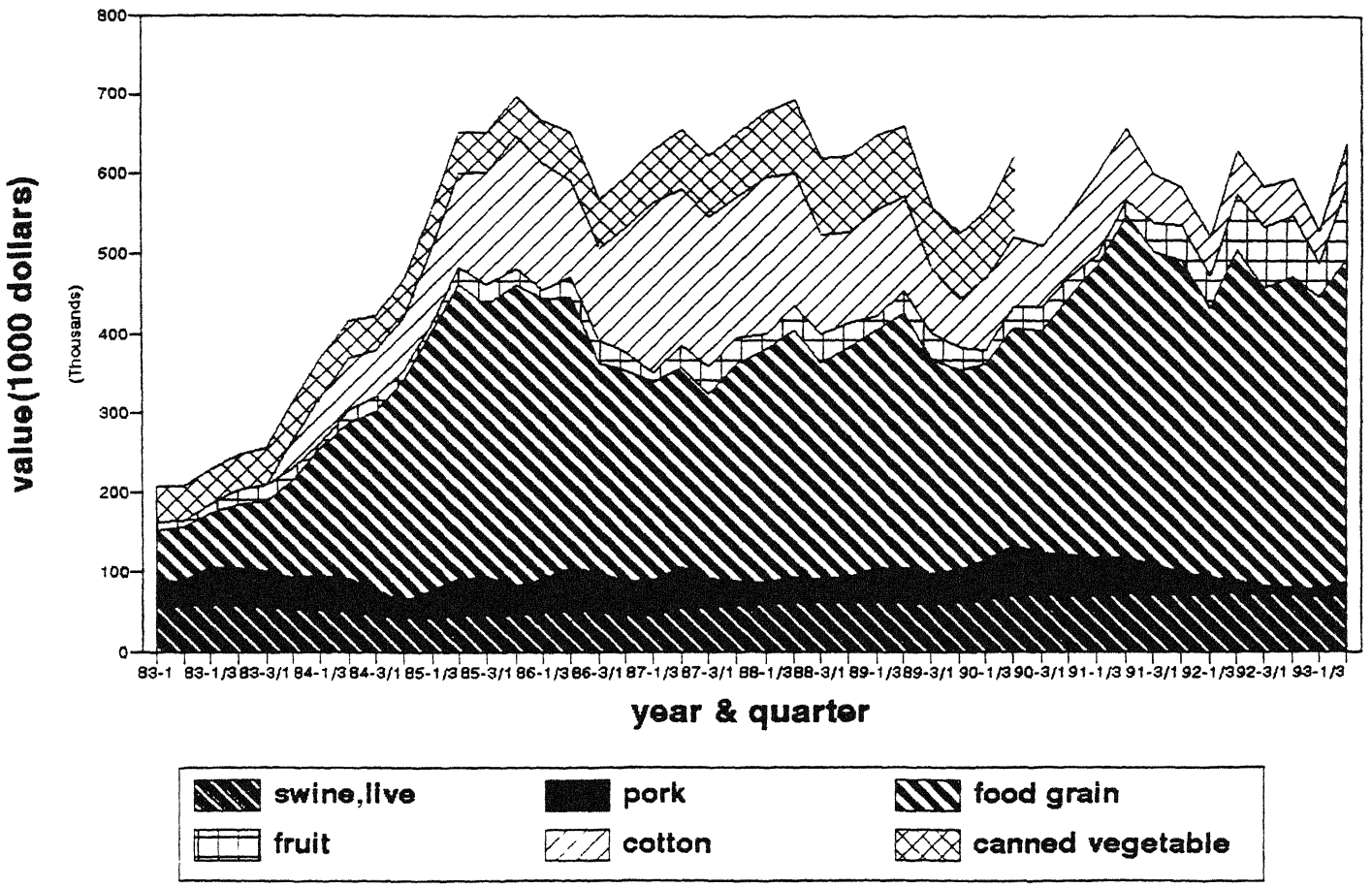
Major Agricultural Exports, Value,China

1983-1993(moving average of 3 quarters)



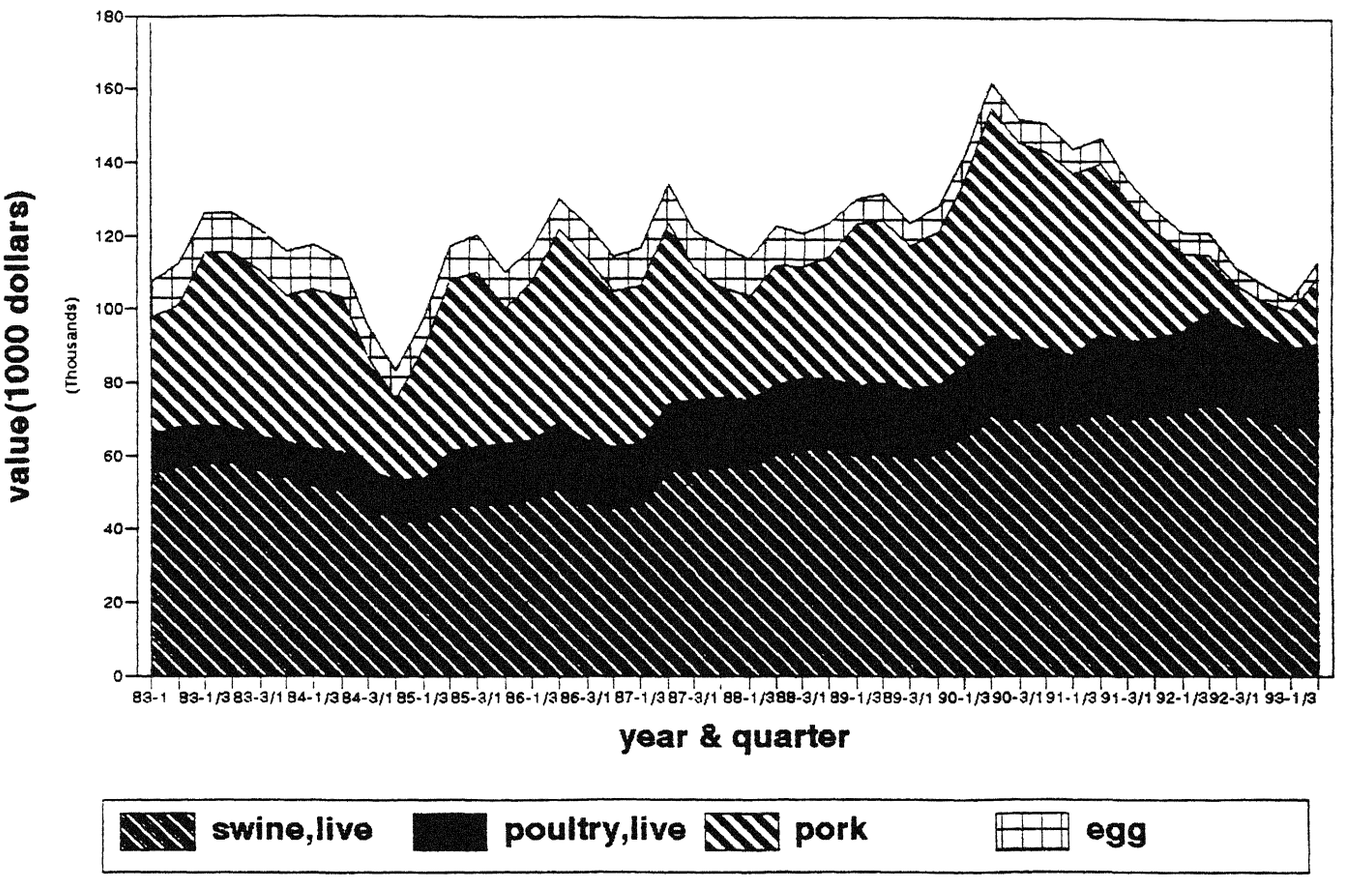
Major Agricultural Exports, Value,China

1983-1993(moving average of 3 quarters)



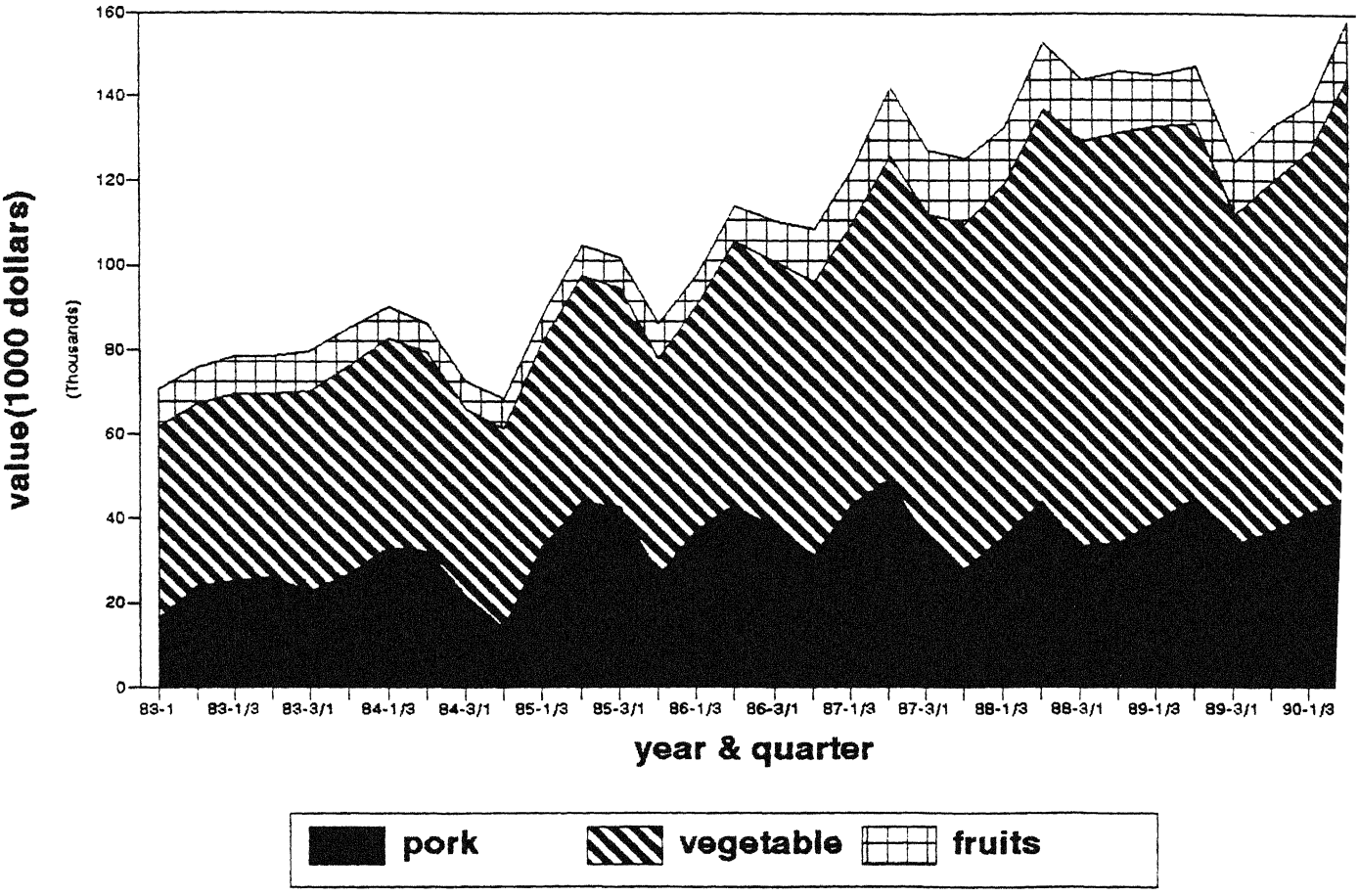
Major Animal Exports, Value, China

1983-1993(moving average of 3 quarters)



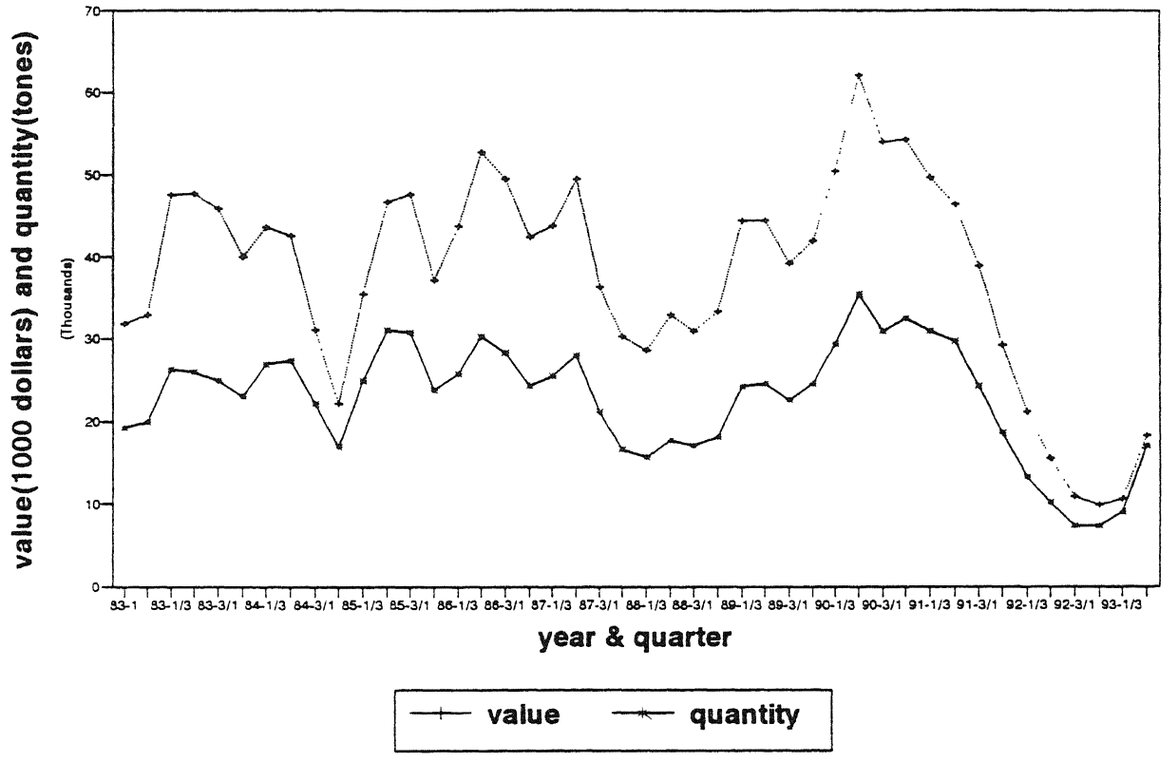
Canned Food Export, Value, China

1983-1990(moving average of 3 quarters)



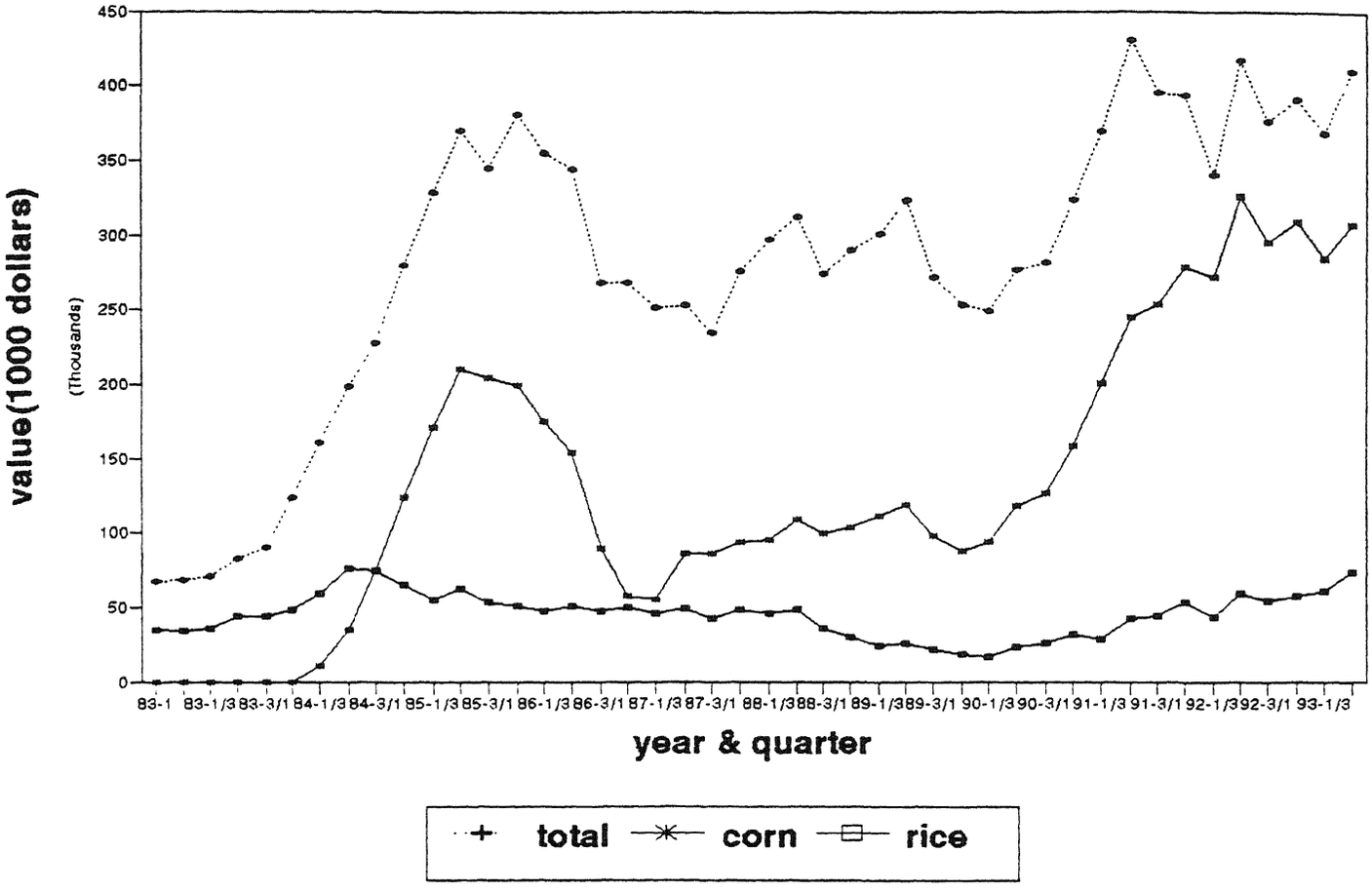
Pork Export, Value and Quantity, China

1983-1993(moving average of 3 quarters)



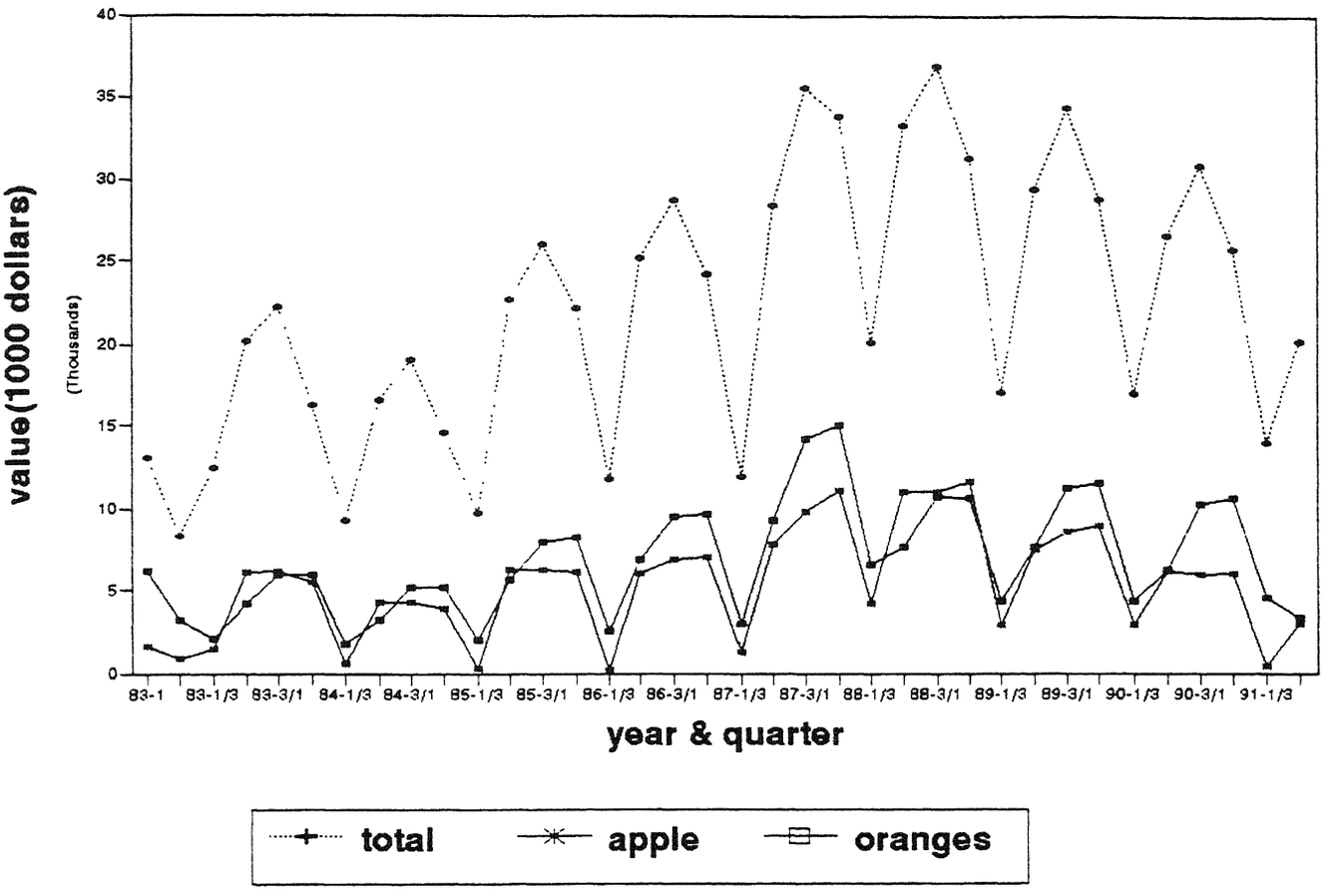
Grain Export, Value, Mainland China

1983-1993(moving average of 3 quarters)

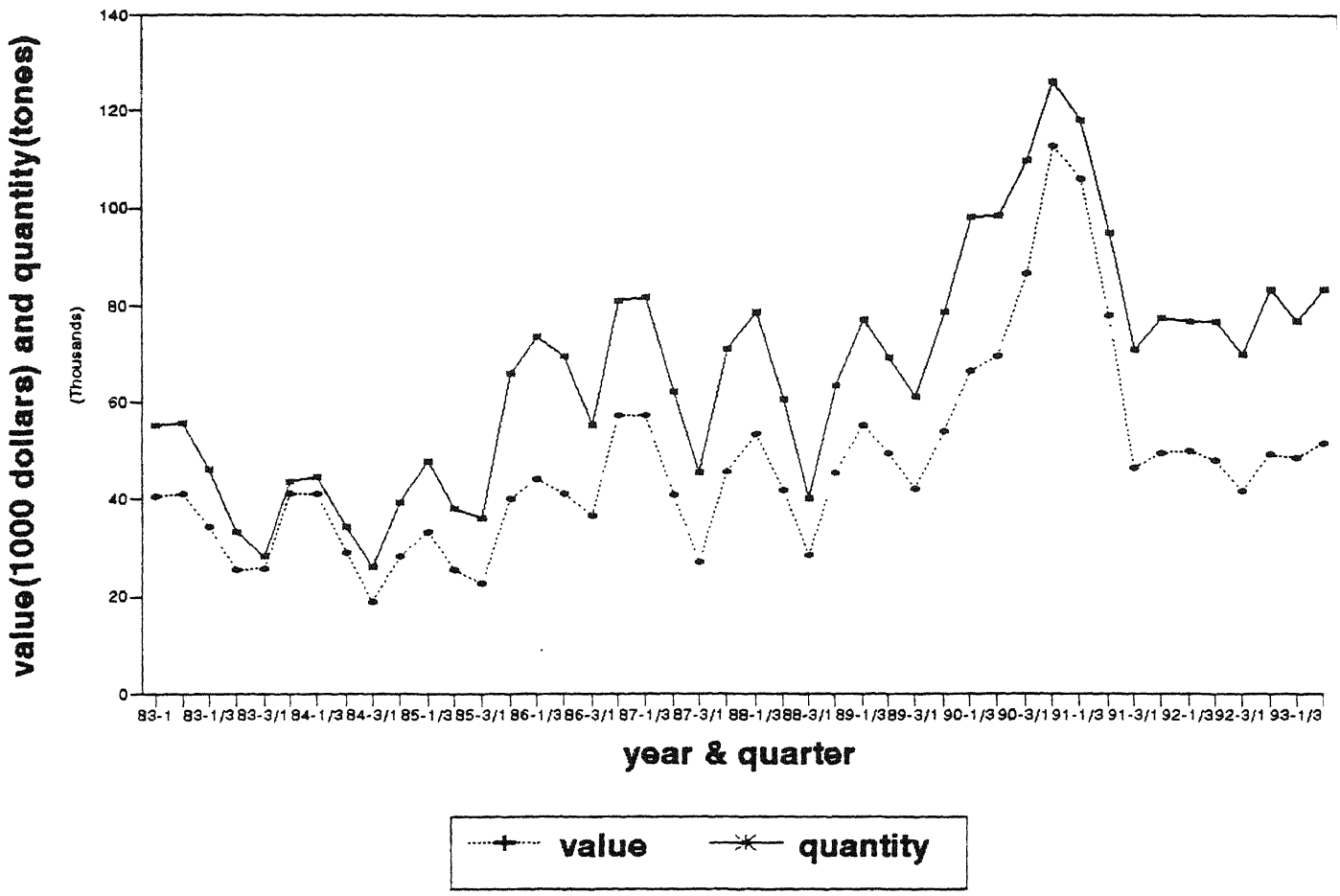


Fruit Export, Value, Mainland China

1983-1991 (moving average of 3 quarters)

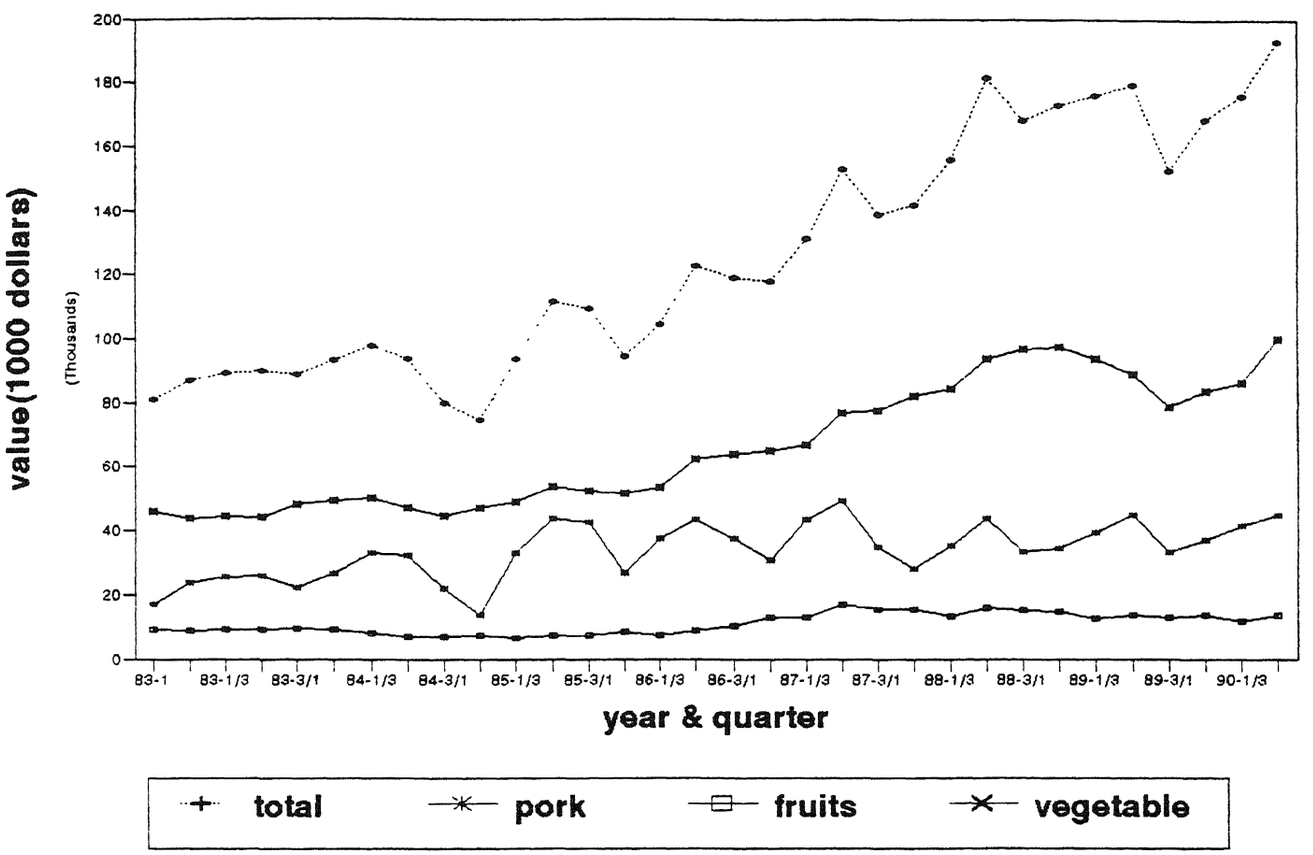


Peanut Export, Value and Quantity,China
1983-1993(moving average of 3 quarters)



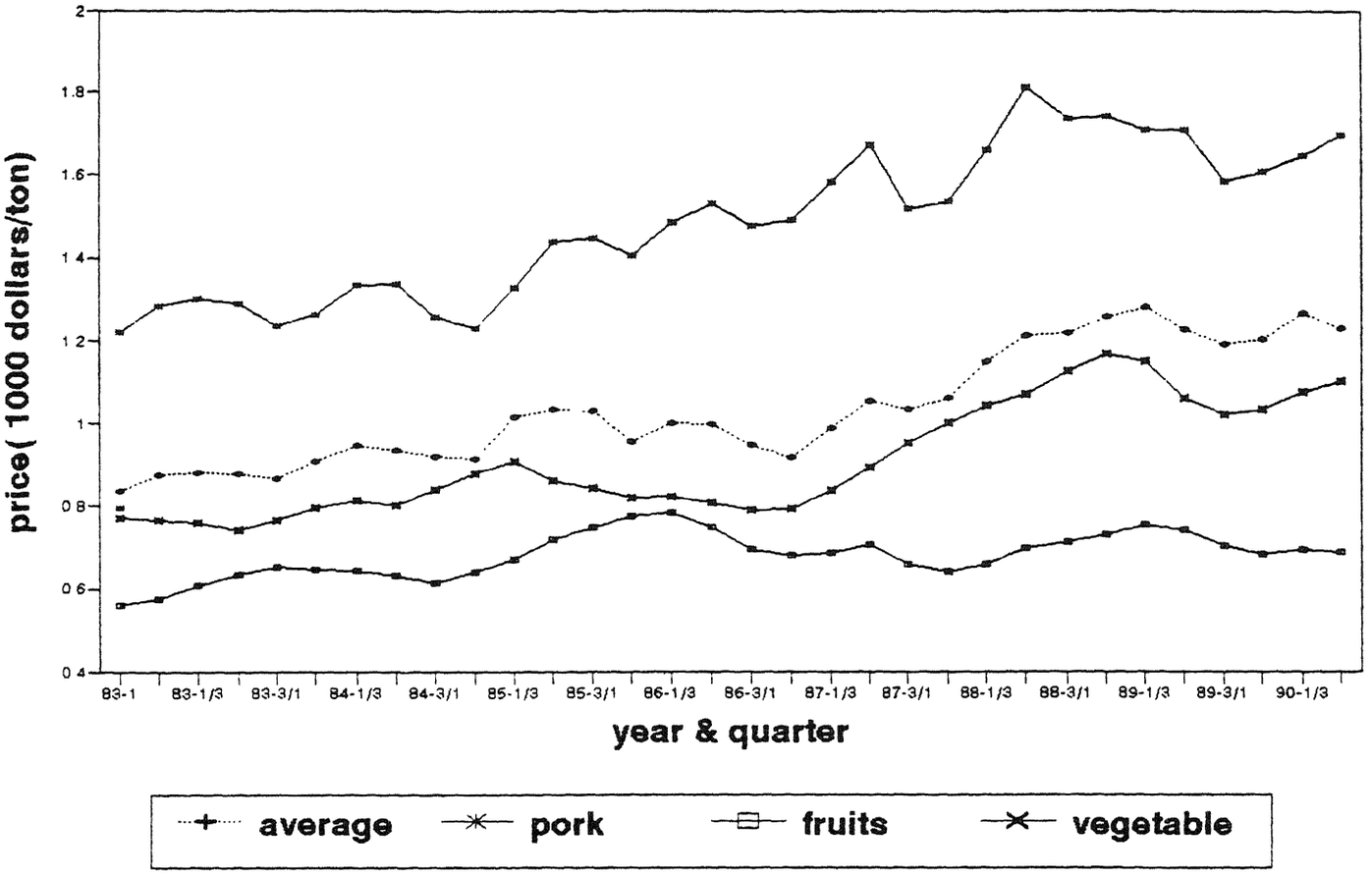
Canned Food Export, Value, China

1983-1990(moving average of 3 quarters)



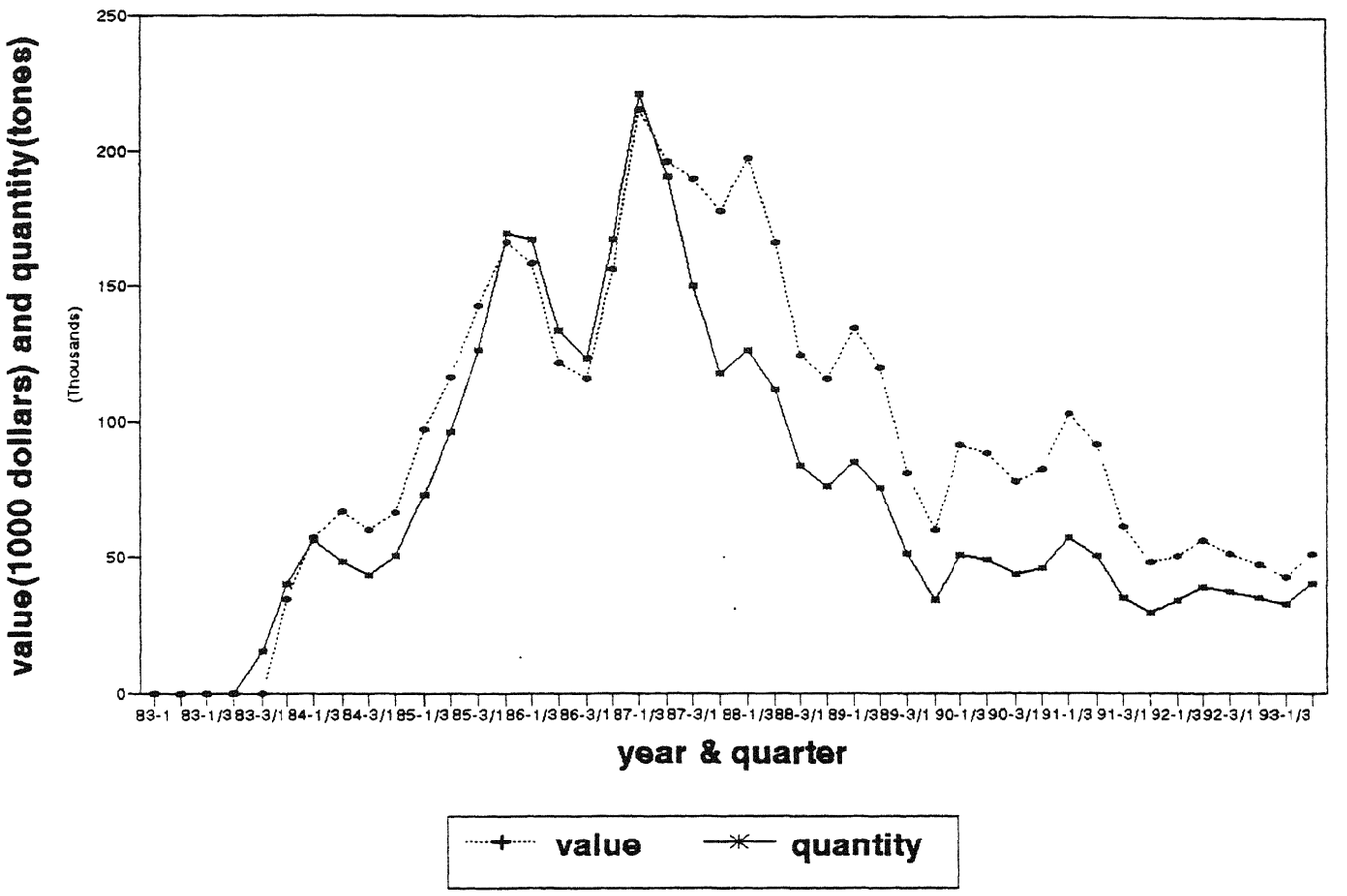
Canned Food Export, Prices, China

1983-1990(moving average of 3 quarters)



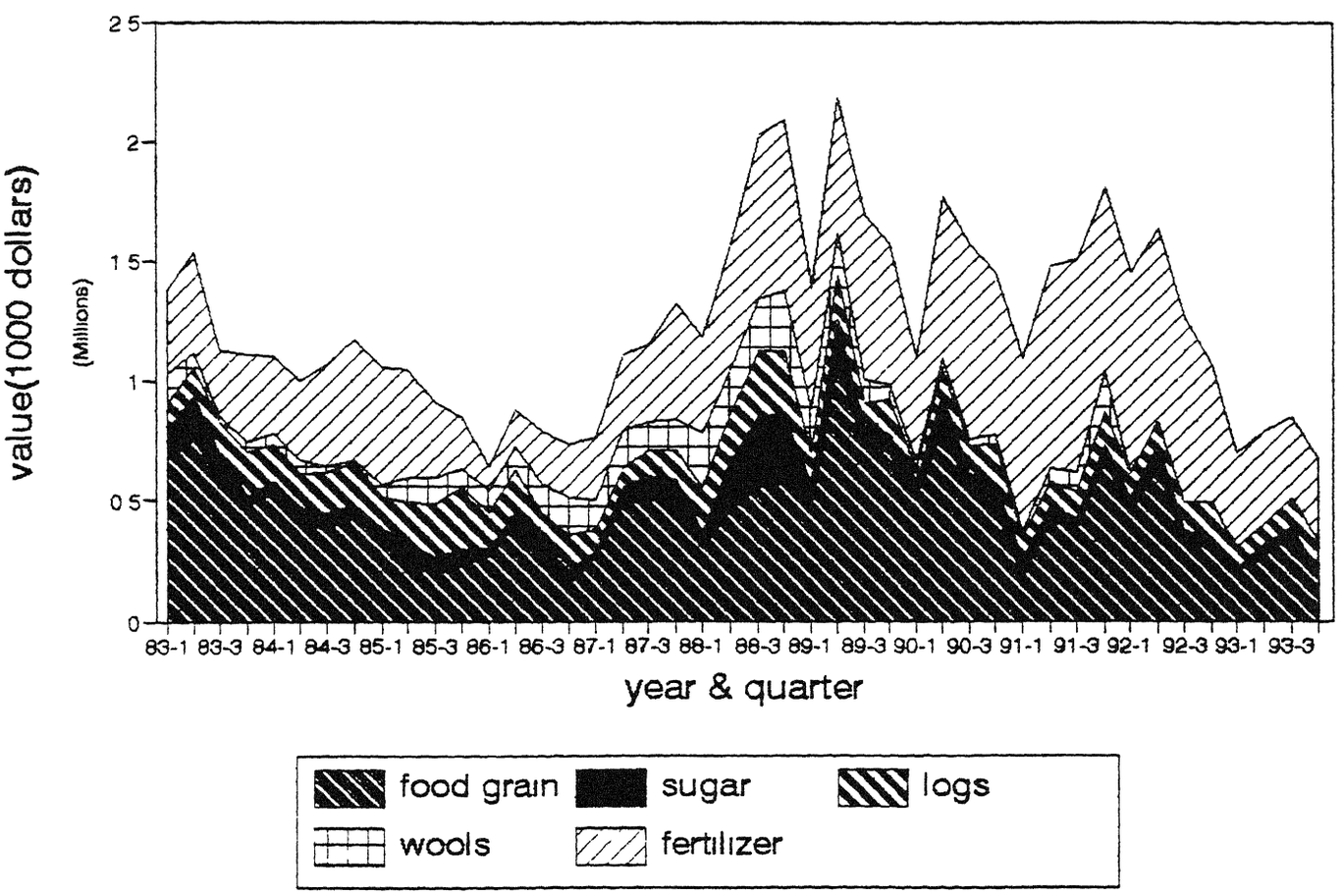
Cotton Export, Value and Quantity,China

1983-1993(moving average of 3 quarters)



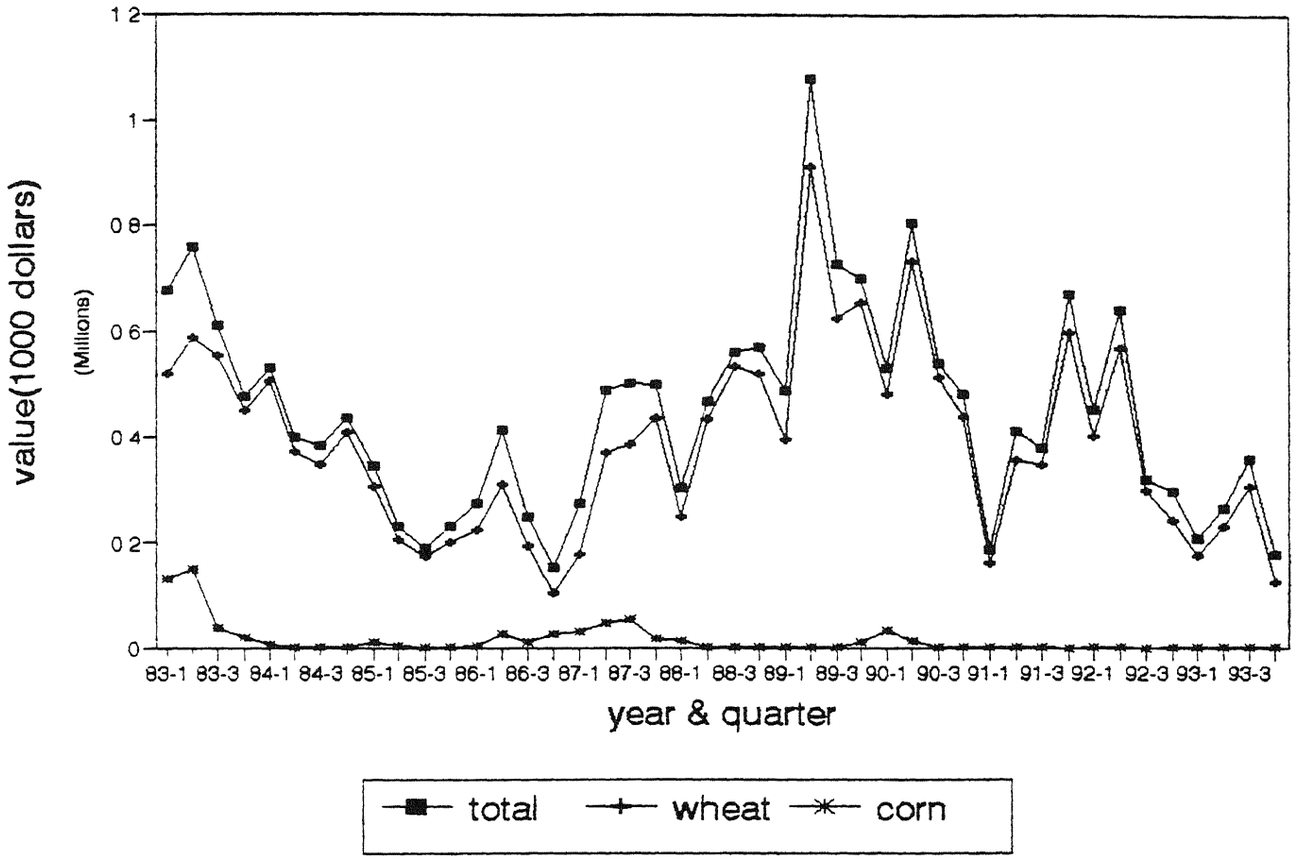
Major Agricultural Import, Value

Mainland China 1983-1993(by quarter)



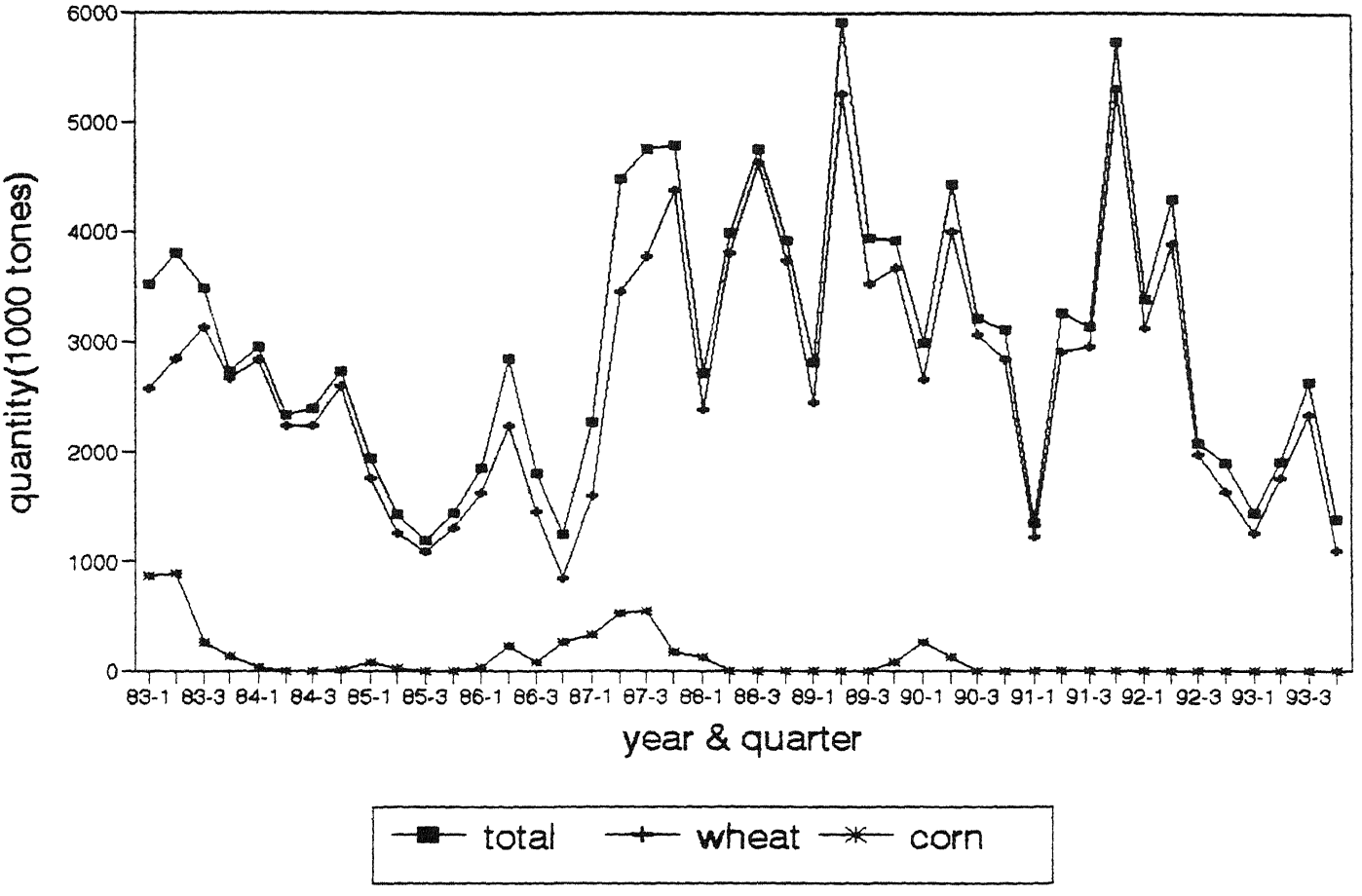
Grain Import, Value

Mainland China 1983-1993(by quarter)



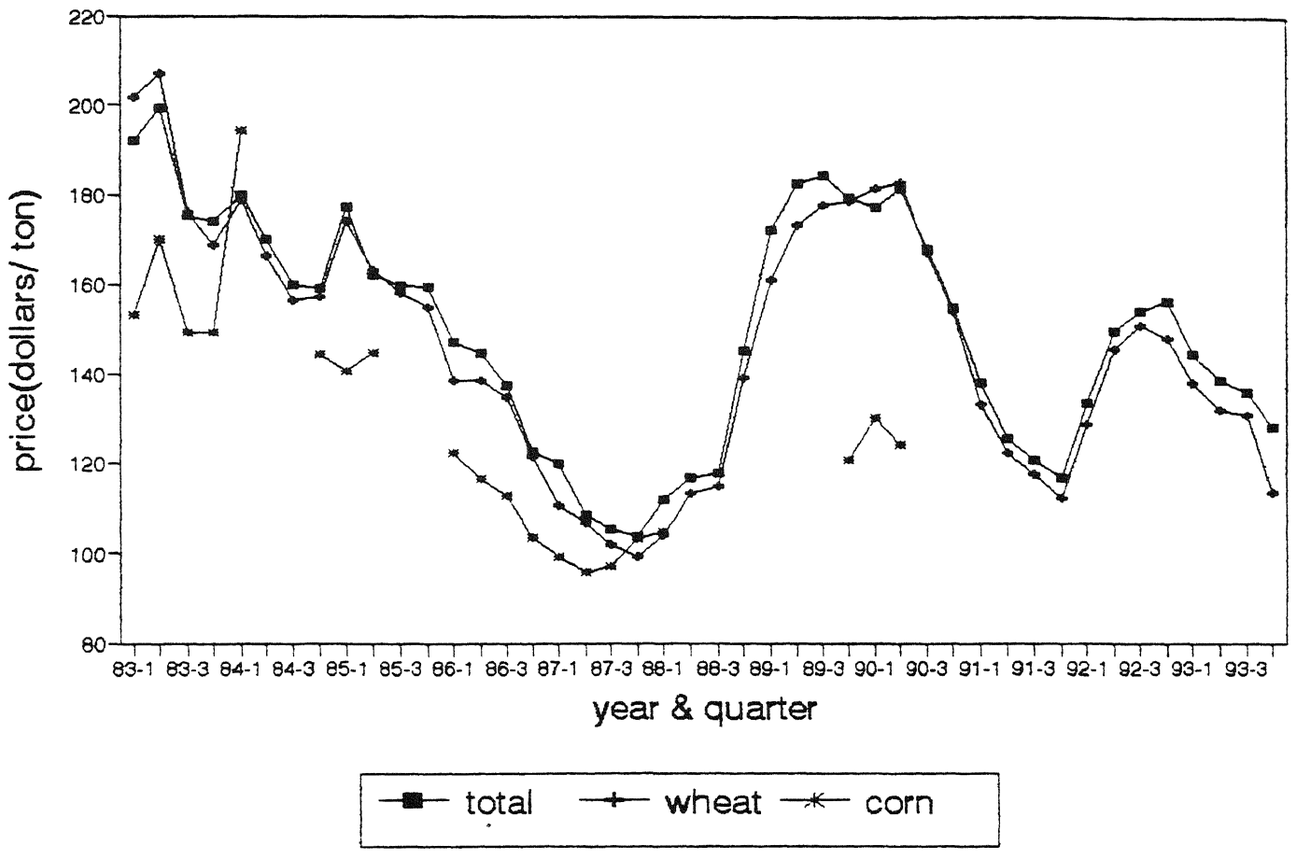
Grain Import, Quantity

Mainland China 1983-1993(by quarter)



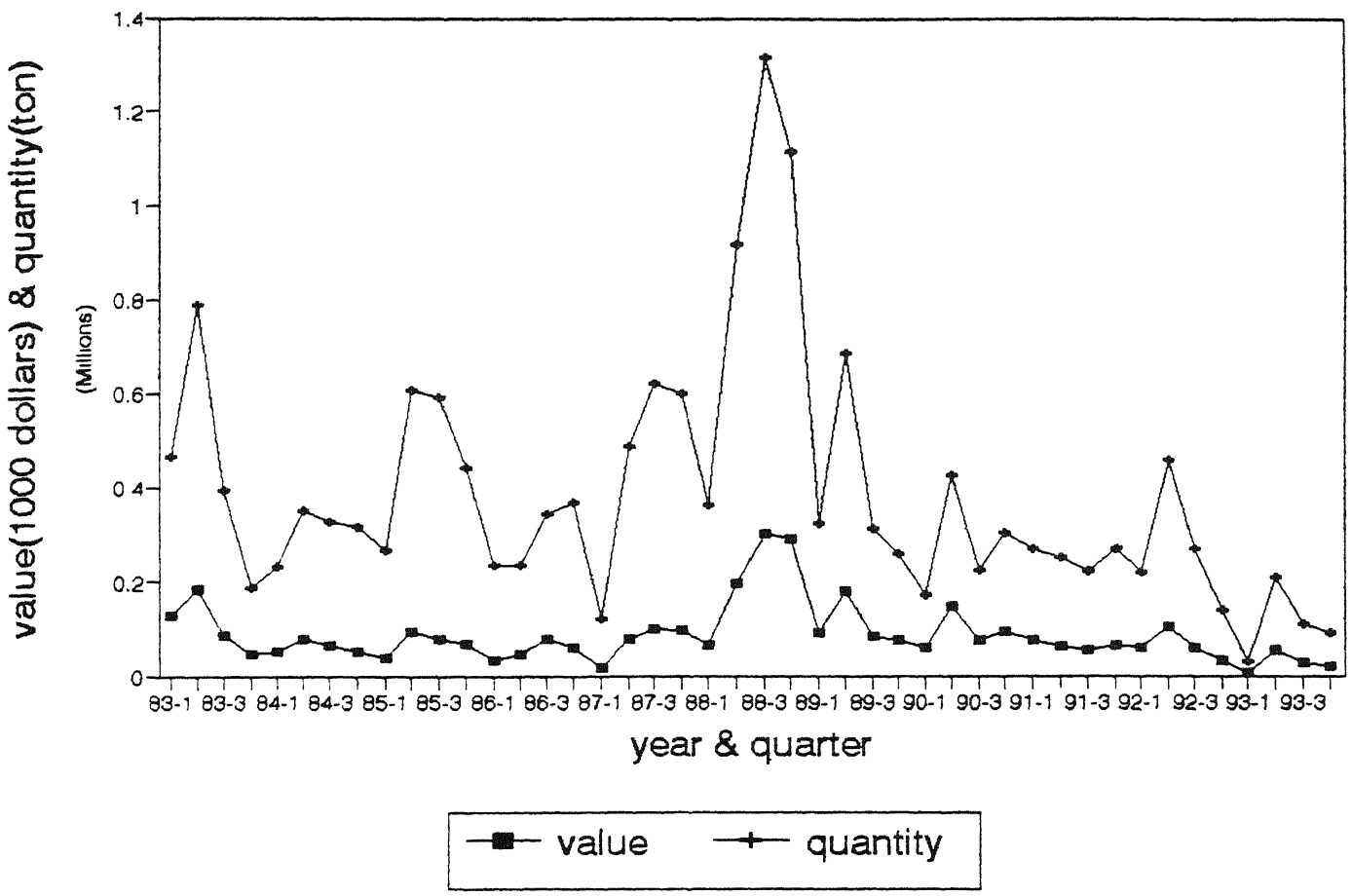
Grain Import, Prices

Mainland China 1983-1993(by quarter)



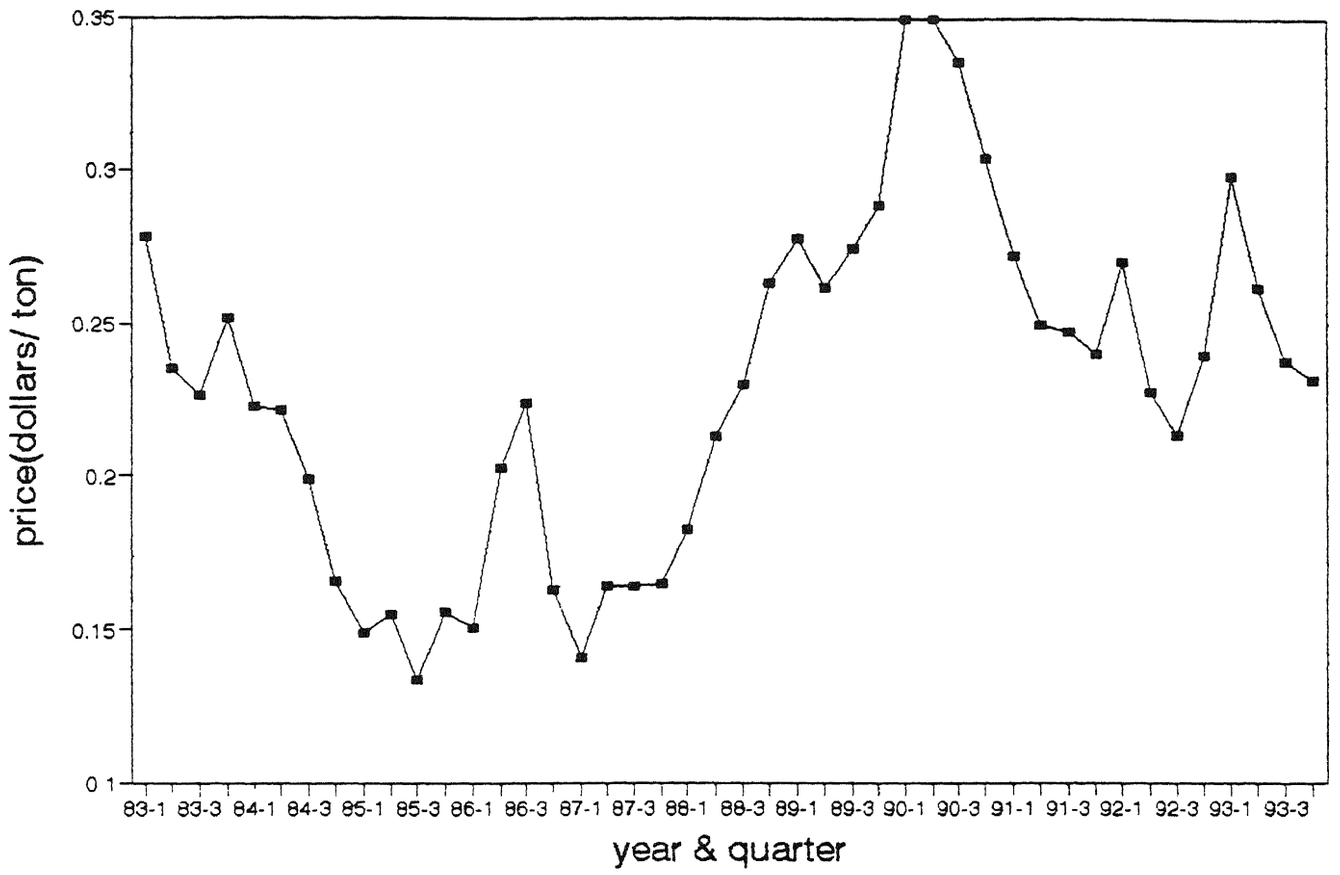
Sugar Import, Value and Quantity

Mainland China 1983-1993(by quarter)



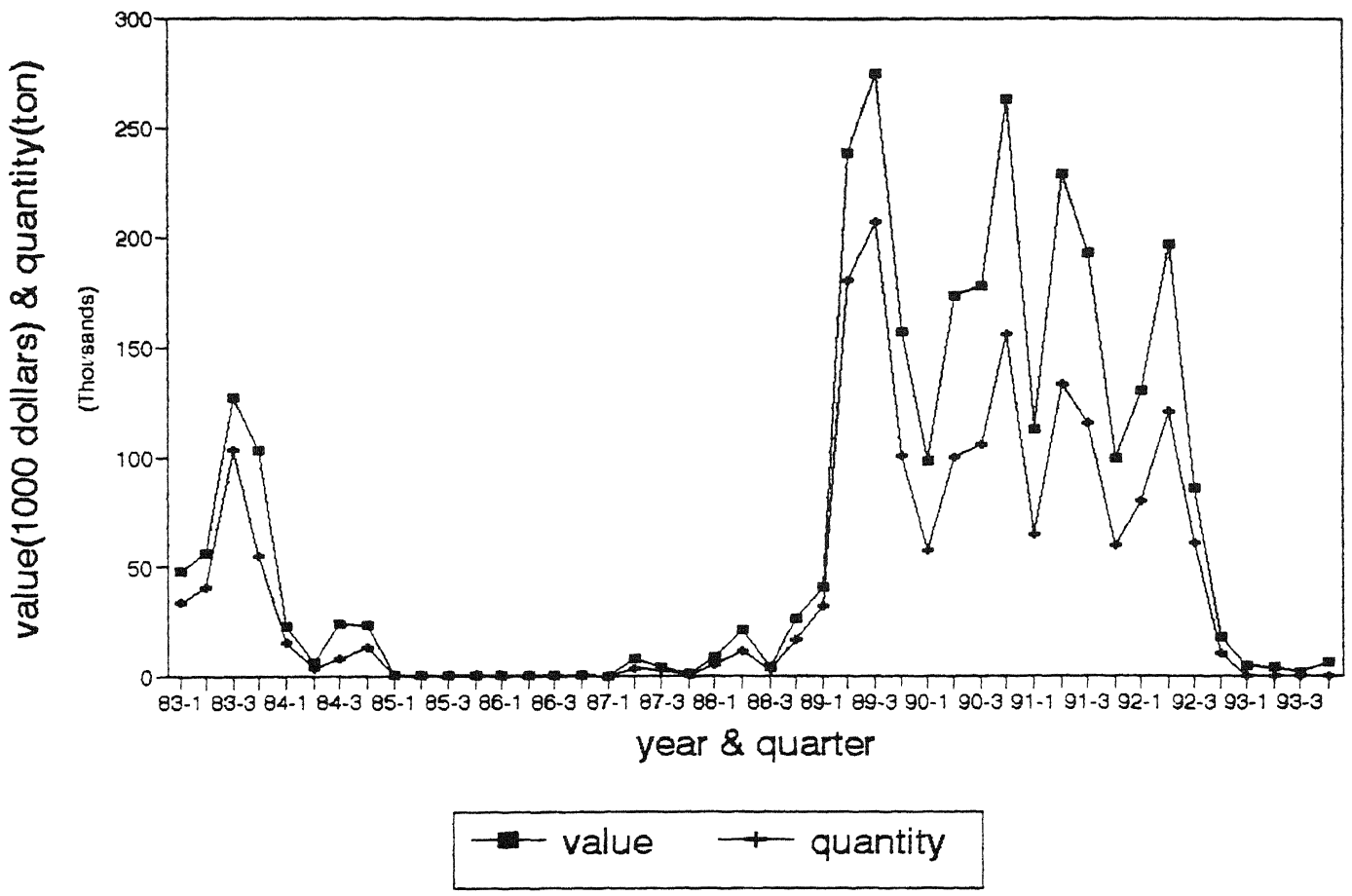
Sugar Import, Prices

Mainland China 1983-1993(by quarter)



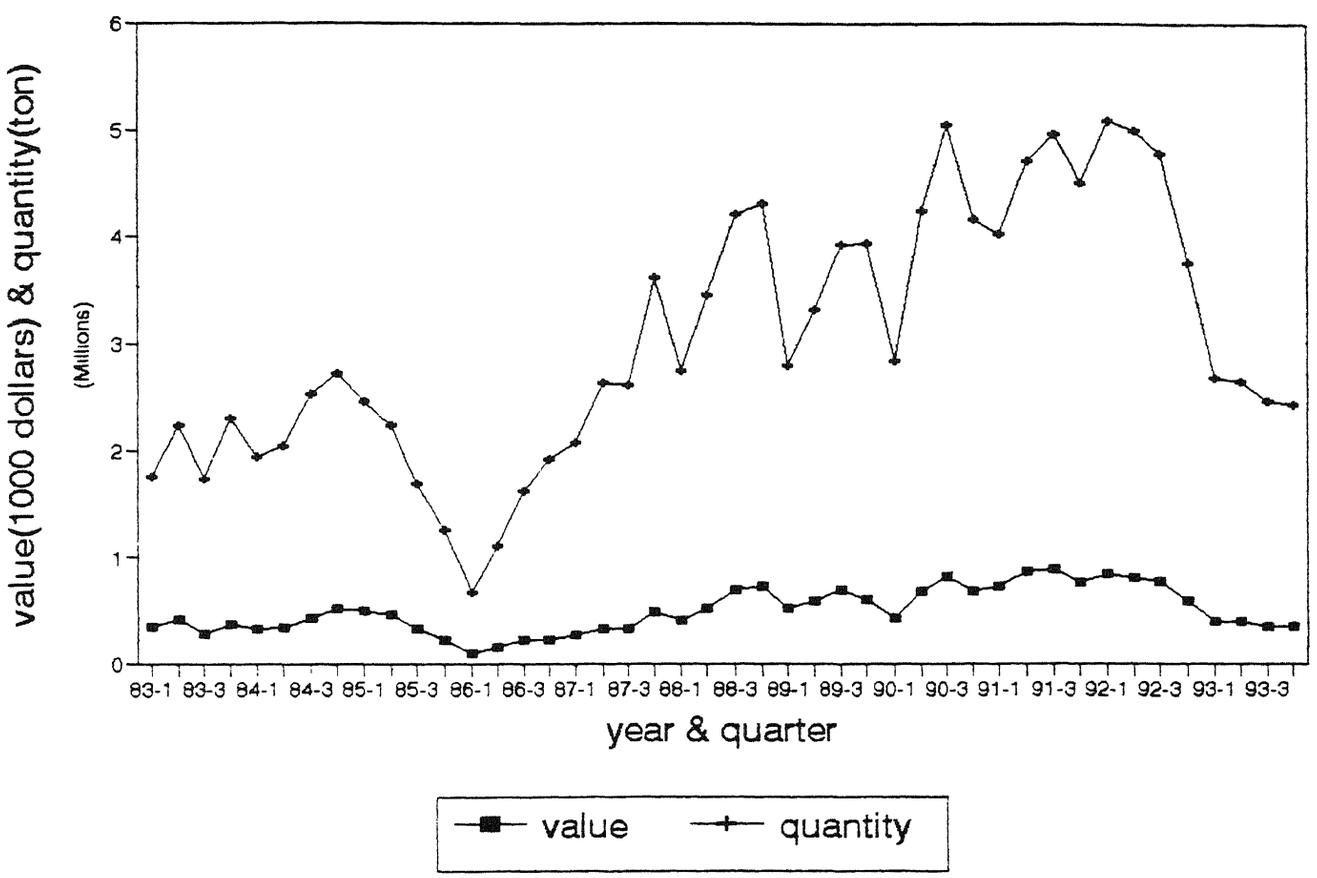
Cotton Import, Value and Quantity

Mainland China 1983-1993(by quarter)



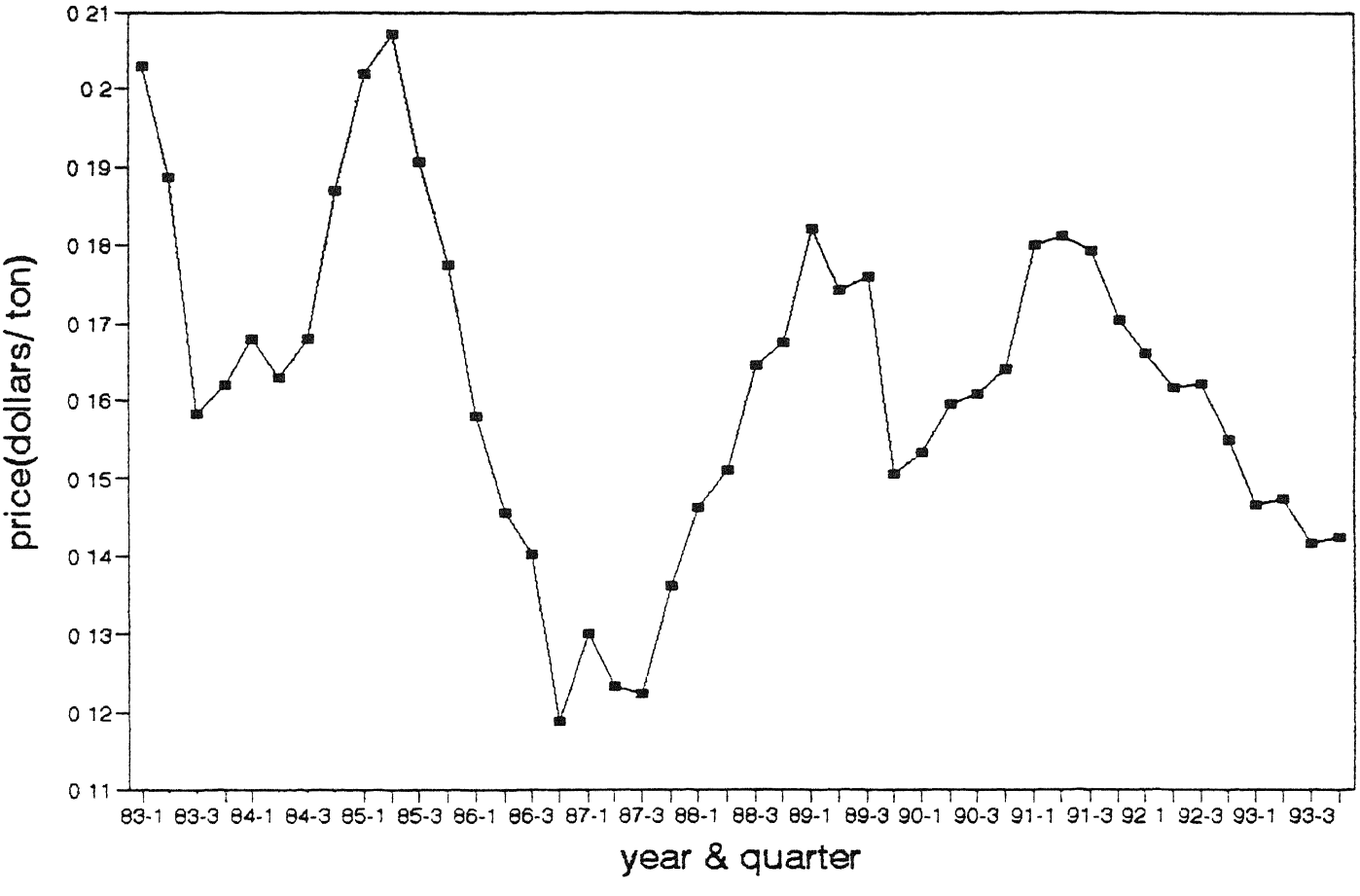
Fertilizer Import, Value and Quantity

Mainland China 1983-1993(by quarter)



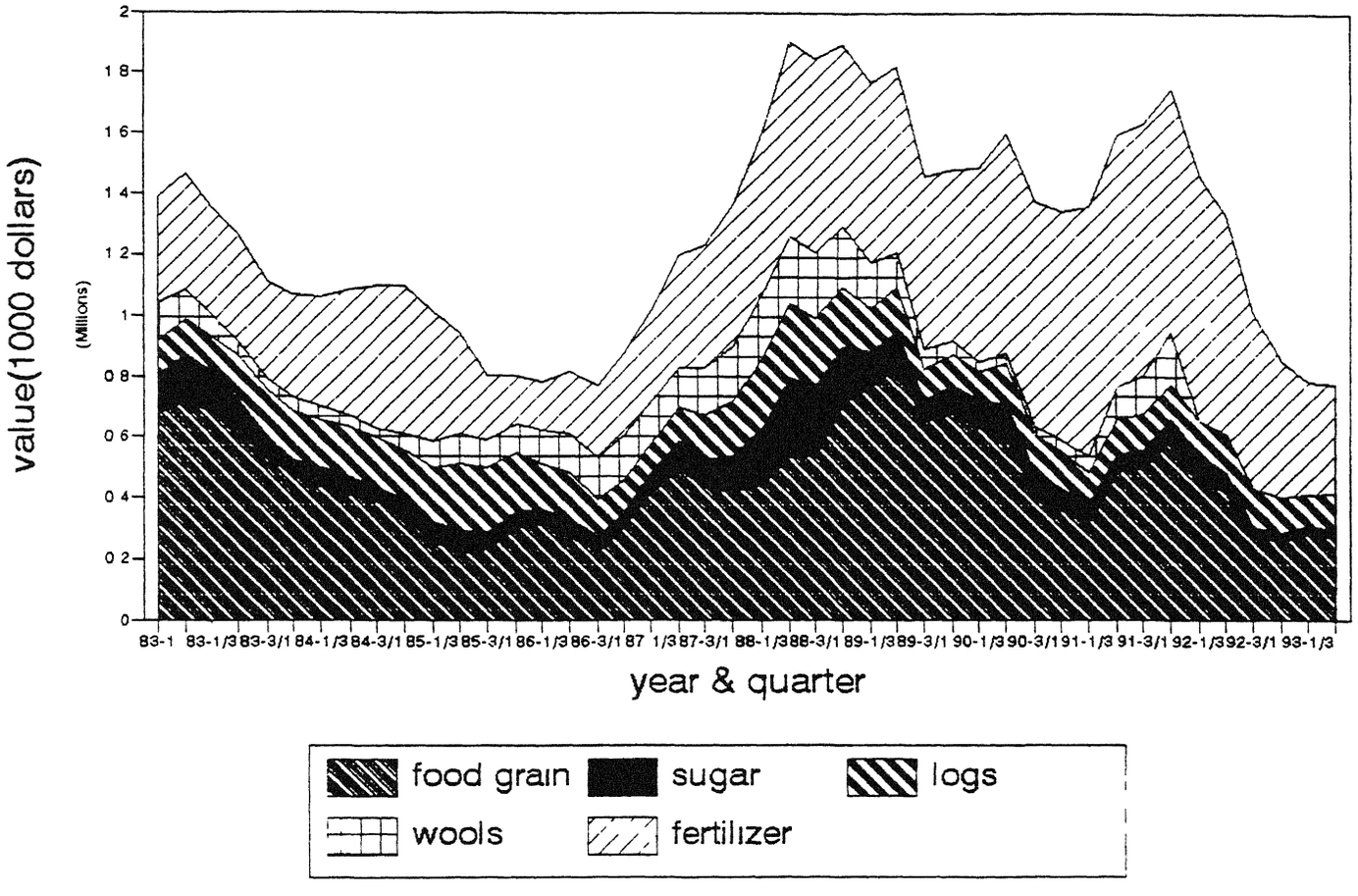
Fertilizers Import, Prices

Mainland China 1983-1993(by quarter)



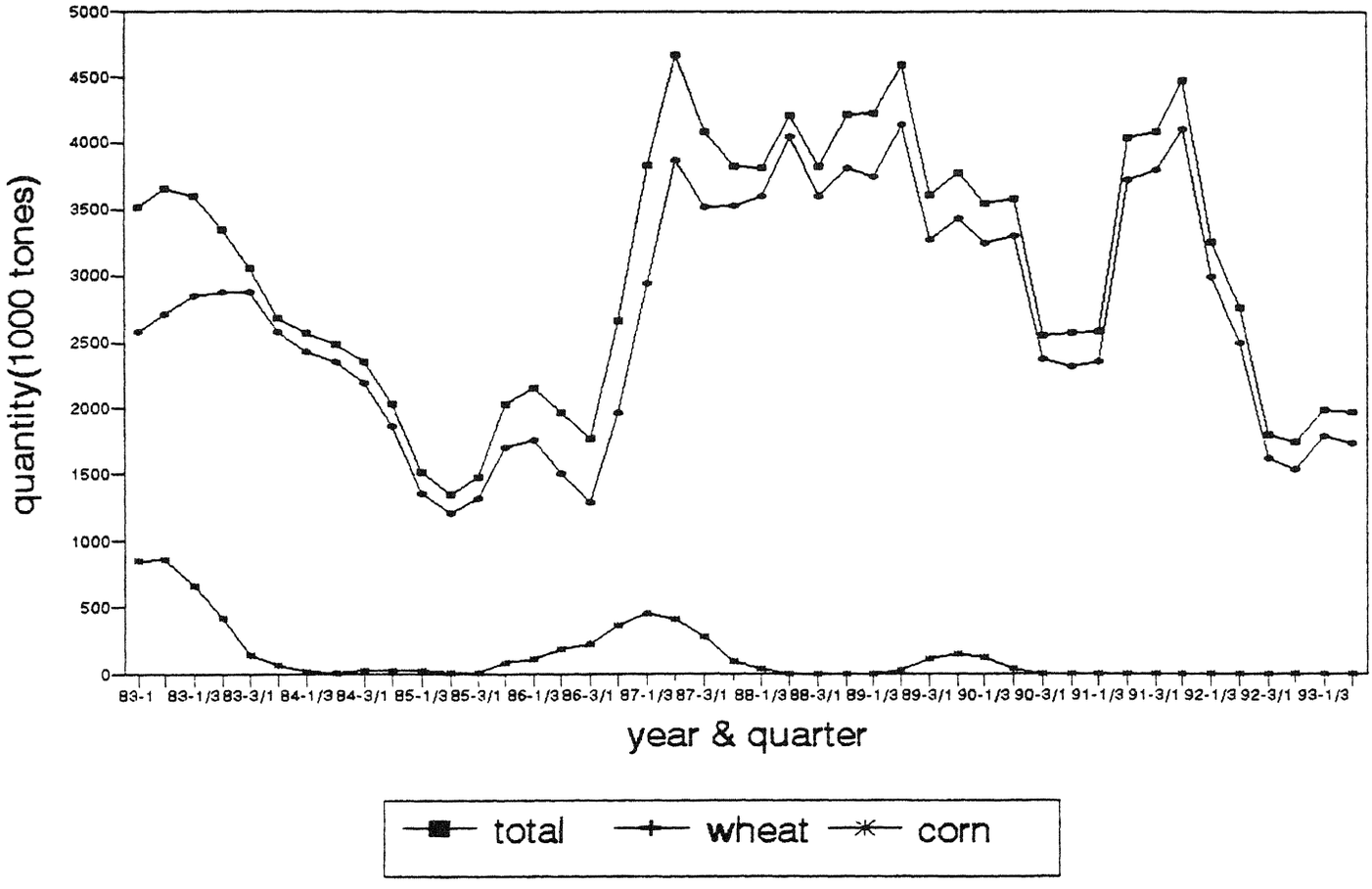
Major Agricultural Import, Value, China

1983-1993(moving average of 3 quarters)



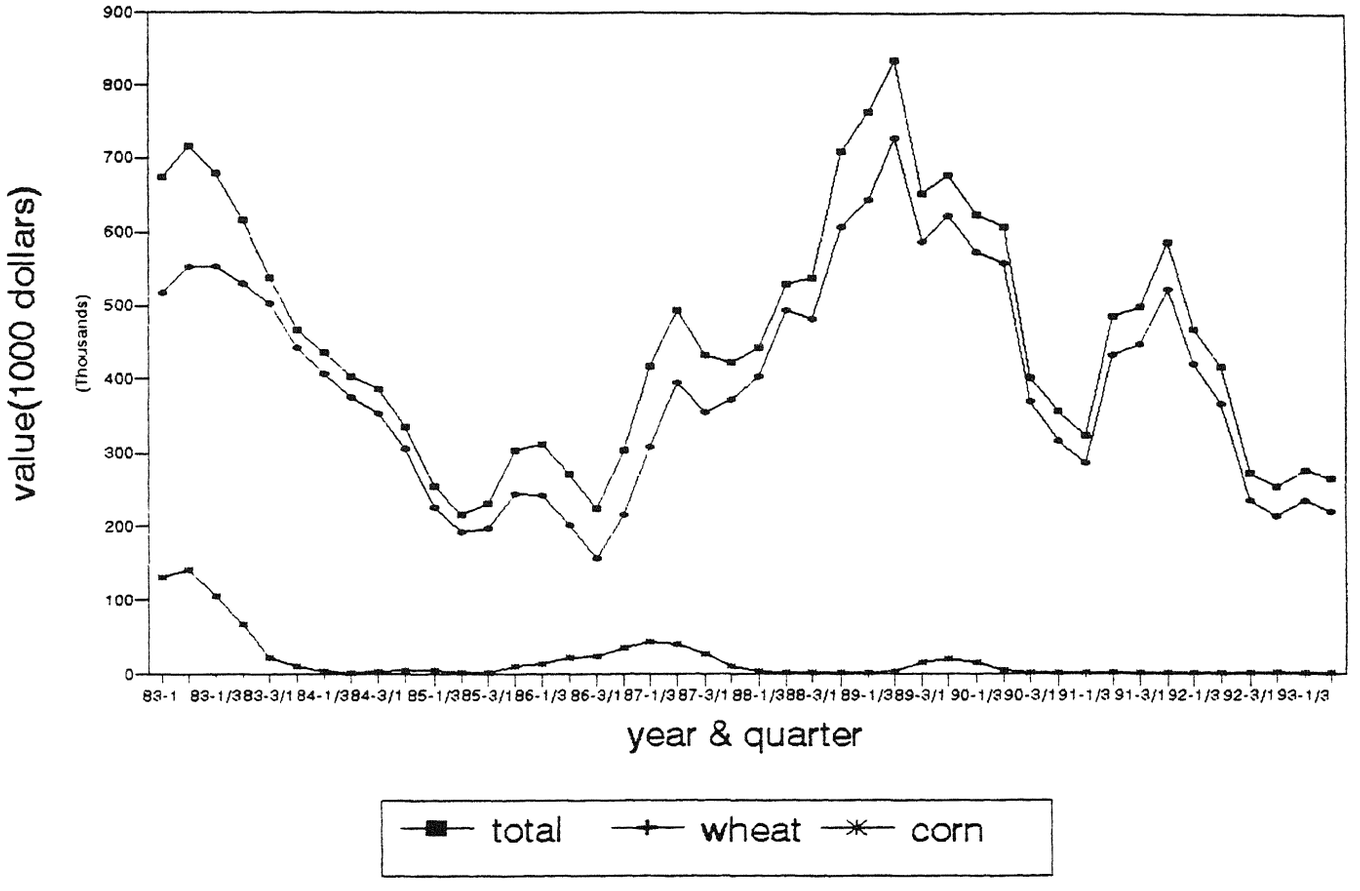
Grain Import, Quantity, Mainland China

1983-1993(moving average of 3 quarters)



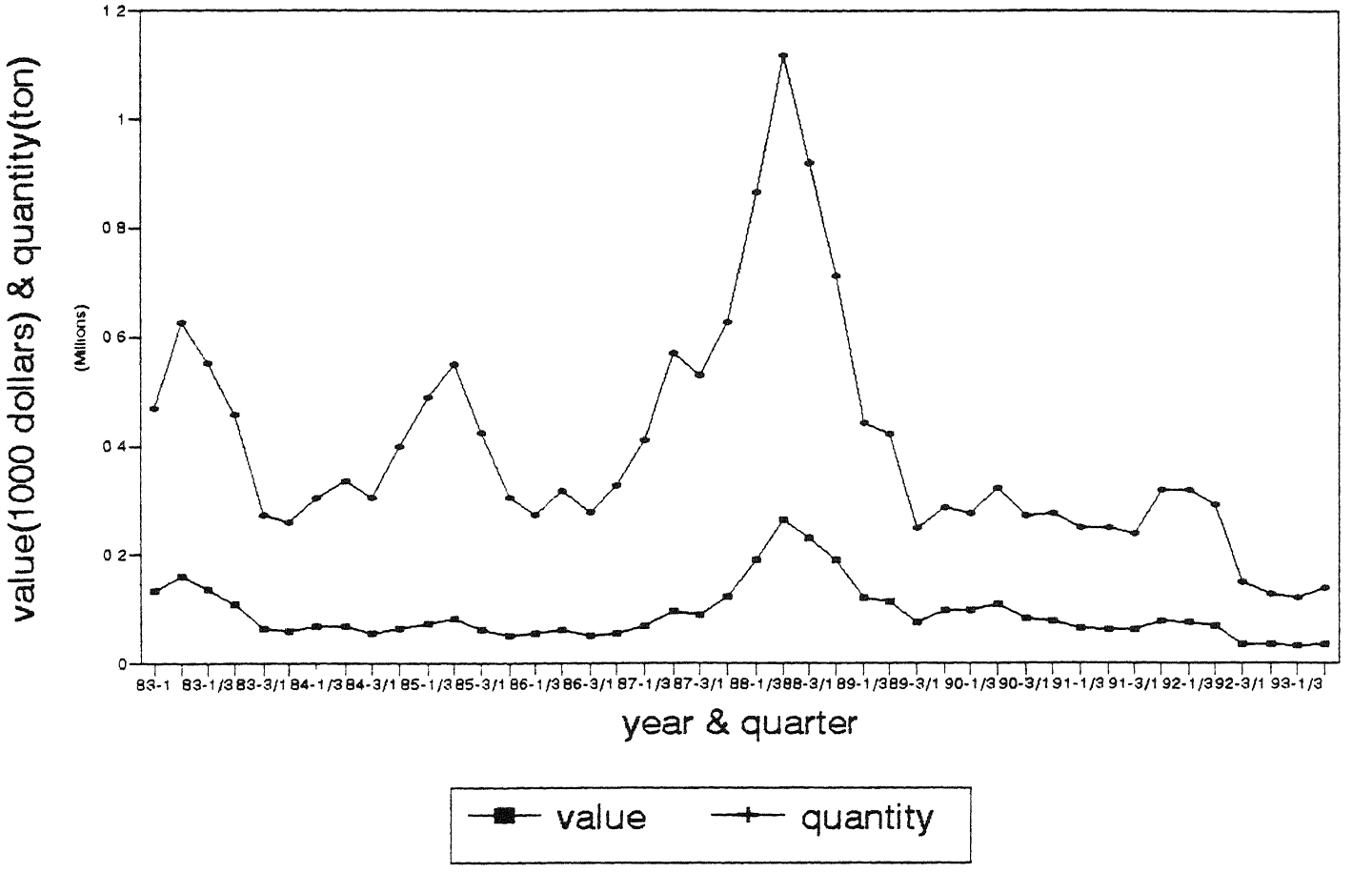
Grain Import, Value, Mainland China

1983-1993(moving average of 3 quarters)



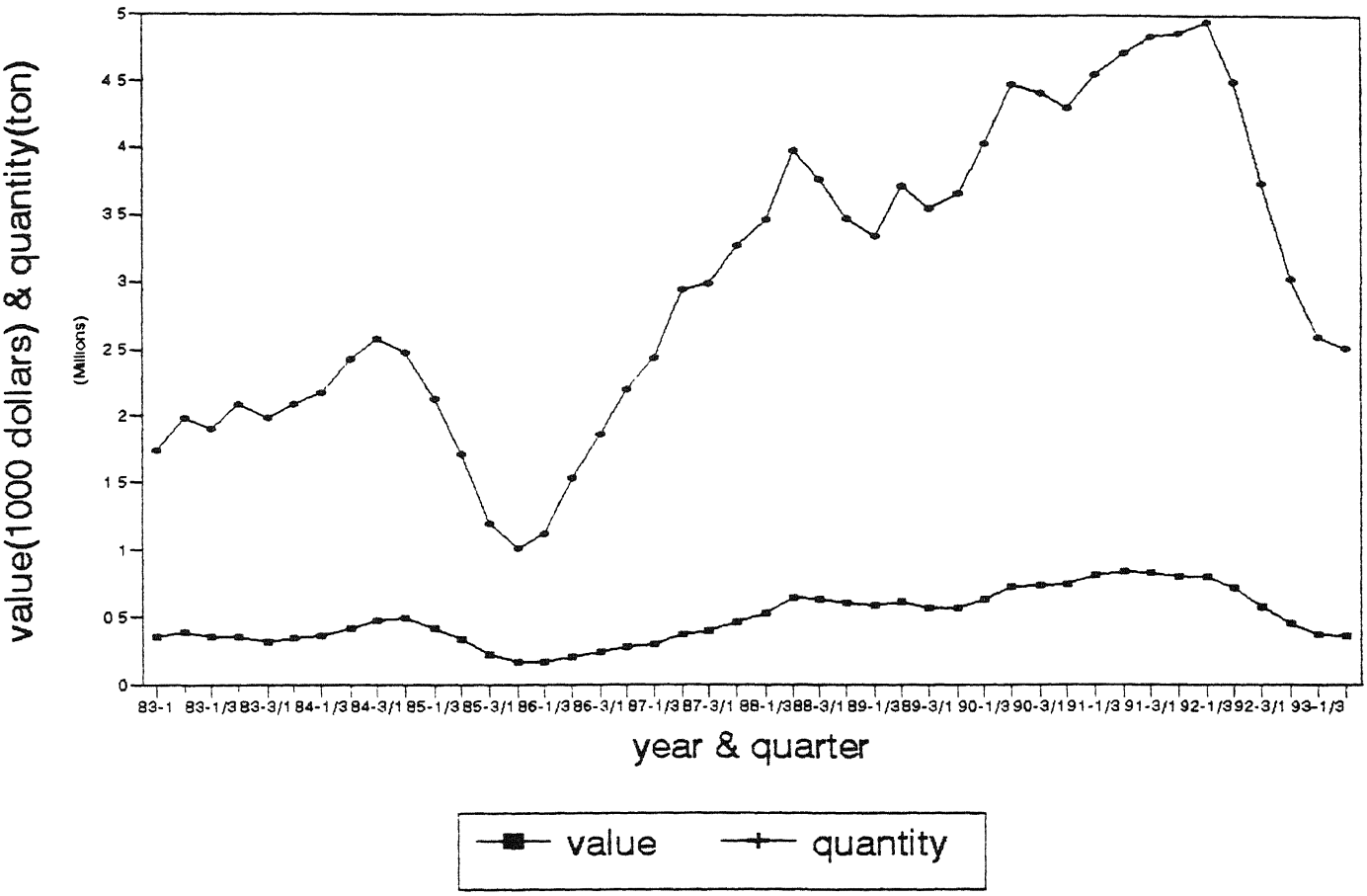
Sugar Import, Value and Quantity, China

1983-1993(moving average of 3 quarters)



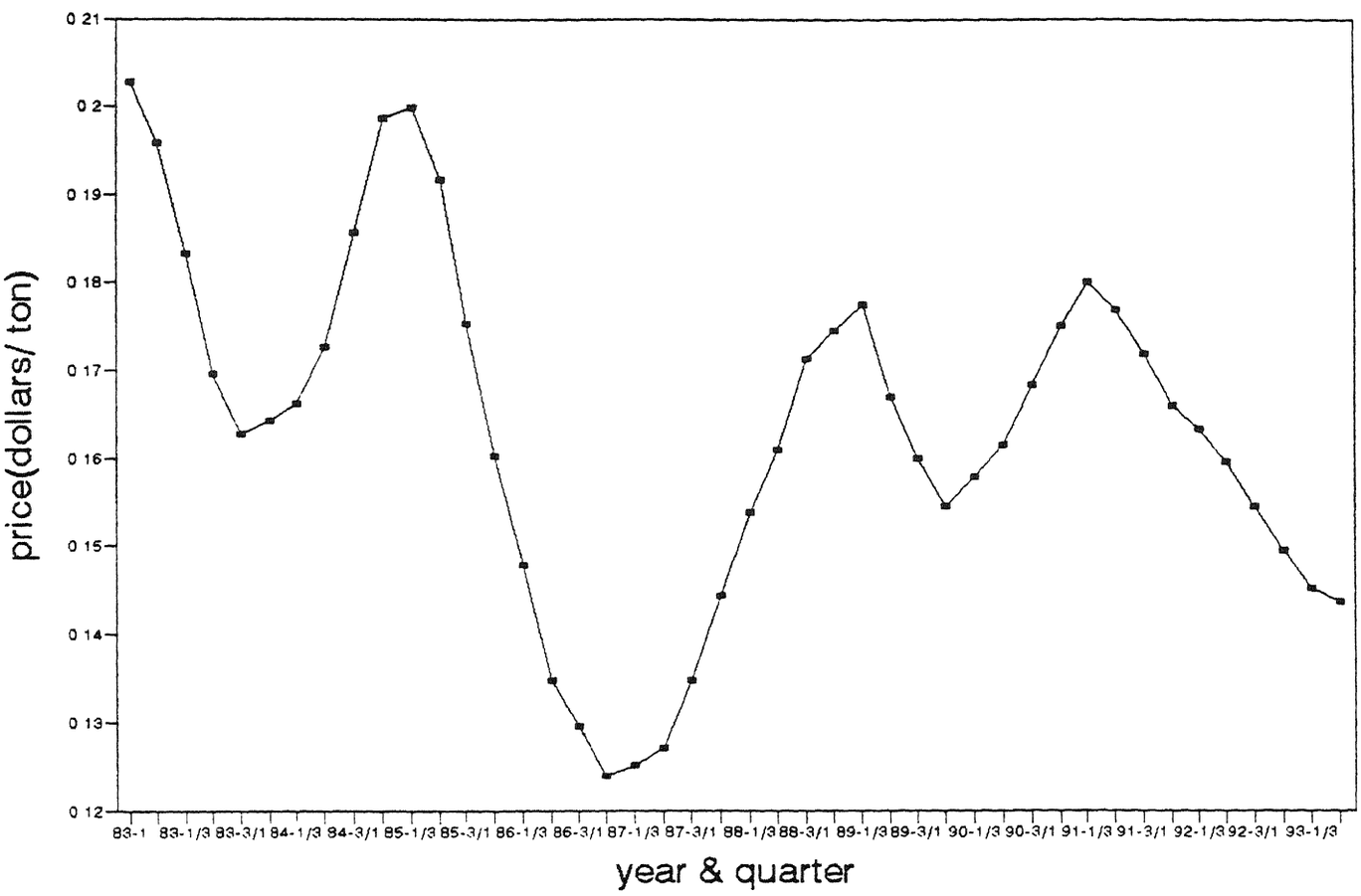
Fertilizer Import, Value and Quantity

1983-1993(moving average of 3 quarters)



Fertilizer Import,Price,Mainland China

1983-1993(moving average of 3 quarters)



Appendix D

Agricultural Production, Cultivated Areas and Exports in Jiangsu Province

Data Series: Annual Data, 1949-1992

TOTAL CULTIVATED AREAS FOR MAJOR GRAIN CROPS IN JIANGSU PROVINCES(10 THOUSAND MUS)

YEAR	GRAINS	WHEAT	RICE	SWEAT POTATOES	CORN	SOYBEAN
1952	12,336	3,005	2,955	576	907	1,363
1957	11,973	2,936	3,266	555	884	1,184
1962	10,758	2,076	2,693	603	741	999
1965	9,317	2,298	2,853	722	674	786
1970	9,367	2,270	3,558	607	697	643
1975	9,567	1,988	4,457	548	569	422
1978	9,466	2,119	3,992	717	668	518
1979	9,272	2,244	4,055	589	615	361
1980	12,373	2,324	4,014	498	579	355
1981	12,929	2,548	3,897	562	667	488
1982	12,939	2,800	3,753	489	725	508
1983	12,813	3,021	3,780	474	686	469
1984	12,875	3,353	3,774	442	646	429
1985	12,837	3,256	3,647	424	989	477
1986	12,771	3,399	3,633	413	724	525
1987	12,751	3,327	3,599	399	743	528
1988	12,577	3,371	3,576	377	712	477
1989	12,576	3,530	3,630	372	752	464
1990	12,389	3,599	3,682	332	692	367
1991	12,318	3,547	3,527	322	640	267
1992	12,352	3,549	3,671	289	632	288

TOTAL CULTIVATED AREAS FOR MAJOR ECONOMICAL CROPS IN JIANGSU PROVINCE(10 THOUSAND MUS).

YEAR	COTTON	OIL CROPS	PEANUT
1952	682	164	179
1957	846	140	240
1962	625	108	126
1965	846	108	175
1970	878	126	107
1975	880	222	108
1978	885	235	98
1979	883	299	116
1980	947	254	126
1981	994	429	163
1982	1,020	530	197
1983	1,016	471	142
1984	1,082	375	150
1985	888	664	201
1986	745	714	204
1987	817	744	187
1988	903	608	182
1989	803	689	175
1990	858	661	163
1991	826	724	154
1992	1,010	726	161

TOTAL OUTPUTS FOR MAJOR CROPS IN JIANGSU PROVINCE MEASURED IN 10 THOUSAND TONS

YEAR	GRAINS	COTTON	PERNUT	EDIBLE OIL
1949	748.50	2.81	11.82	3.60
1950	849.00	4.12	11.00	4.50
1951	930.50	6.08	11.50	5.49
1952	997.55	9.28	14.38	6.00
1953	1,063.75	14.70	15.23	3.82
1954	1,049.20	7.56	20.11	5.10
1955	1,179.15	19.57	25.07	5.40
1956	1,081.85	10.09	22.98	4.56
1957	1,063.60	15.01	19.81	4.93
1958	1,128.45	20.54	17.20	4.05
1959	997.20	17.13	12.78	3.90
1960	959.80	12.43	7.06	5.48
1961	903.85	13.93	5.70	1.90
1962	965.35	8.21	6.38	3.52
1963	1,114.90	18.26	7.57	3.19
1964	1,350.30	33.38	16.23	5.14
1965	1,442.75	26.44	13.87	7.41
1966	1,591.70	38.49	15.93	7.76
1967	1,534.05	38.45	14.16	8.52
1968	1,548.30	42.63	14.30	9.45
1969	1,571.75	34.84	11.93	10.54
1970	1,705.15	32.82	10.31	10.87
1971	1,927.70	33.00	10.11	15.03
1972	1,919.90	35.27	10.99	19.32
1973	2,081.45	44.73	13.63	17.51
1974	2,089.85	41.60	12.15	15.49
1975	2,056.85	45.48	11.73	17.63
1976	2,248.45	41.43	8.70	12.88
1977	1,932.60	38.06	9.45	9.22
1978	2,400.65	47.54	13.60	23.06
1979	2,574.70	53.27	13.50	29.31
1980	2,417.95	41.81	14.50	23.96
1981	2,511.65	56.35	20.41	43.13
1982	2,855.45	57.60	23.06	68.03
1983	3,052.75	66.29	22.20	50.90
1984	3,353.60	66.59	24.16	45.41
1985	3,126.52	47.91	34.13	73.11
1986	3,339.56	40.11	36.49	78.91
1987	3,257.70	44.38	33.75	86.28
1988	3,243.36	56.22	35.26	62.40
1989	3,282.80	48.47	31.25	67.72
1990	3,264.15	46.42	30.12	81.41
1991	3,035.51	55.71	28.12	85.32
1992	3,320.55	52.74	30.51	95.88

AGRICULTURAL PRODUCTION AND LAND IN JIANGSU PROVINCE

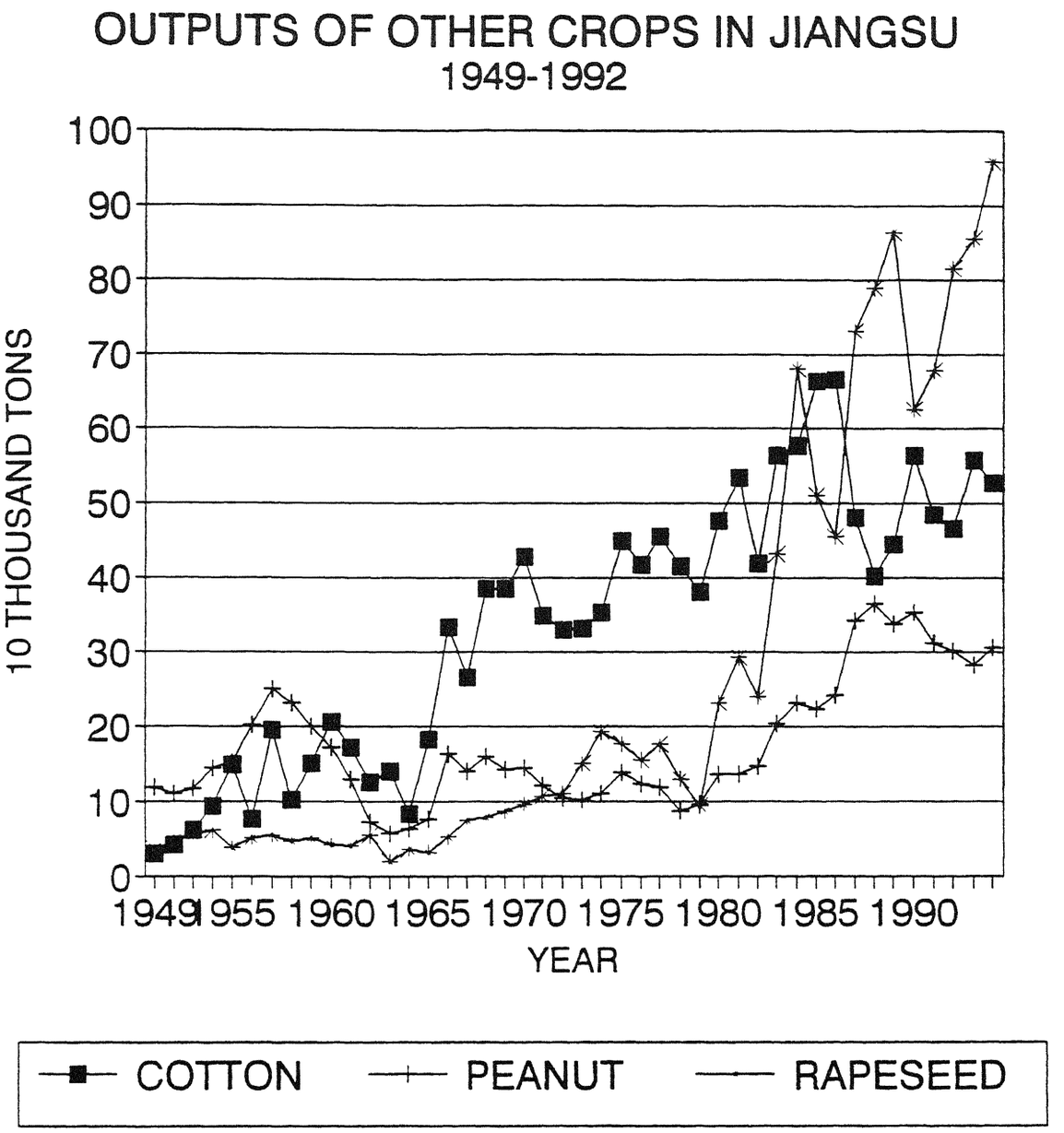
YEAR	PRODUCTS[a]	LAND[b]	LAND PER CAPITA[c]
1949	22.59	8,285.10	2.77
1950	NA	8,400.60	2.75
1951	NA	8,573.10	2.75
1952	31.87	8,712.70	2.75
1953	32.31	8,833.10	2.73
1954	32.45	8,901.40	2.71
1955	36.22	8,902.40	2.67
1956	33.60	8,826.80	2.60
1957	36.81	8,737.80	2.51
1958	38.74	7,833.60	2.45
1959	37.65	7,630.40	2.20
1960	36.76	7,521.00	2.16
1961	35.73	7,496.70	2.16
1962	40.15	7,524.30	2.11
1963	46.77	7,512.60	2.04
1964	56.62	7,477.50	1.98
1965	57.27	7,421.20	1.93
1966	66.08	7,401.60	1.87
1967	61.19	7,363.05	1.81
1968	65.38	7,306.35	1.75
1969	65.60	7,275.54	1.69
1970	71.33	7,230.94	1.62
1971	79.90	7,176.83	1.55
1972	83.24	7,142.96	1.51
1973	89.71	7,106.98	1.49
1974	89.99	7,081.37	1.48
1975	91.66	7,058.29	1.45
1976	100.71	7,034.05	1.42
1977	89.16	7,009.19	1.40
1978	105.87	6,991.18	1.38
1979	145.25	6,975.60	1.37
1980	138.45	6,962.07	1.38
1981	153.62	6,955.52	1.37
1982	188.11	6,946.81	1.35
1983	206.86	6,945.07	1.34
1984	253.82	6,931.64	1.34
1985	288.55	6,906.04	1.33
1986	332.66	6,886.18	1.33
1987	380.25	6,869.72	1.34
1988	497.95	6,853.26	1.33
1989	522.25	6,843.48	1.33
1990	580.53	6,836.79	1.28
1991	580.93	6,824.96	1.27
1992	673.82	6,782.66	1.26

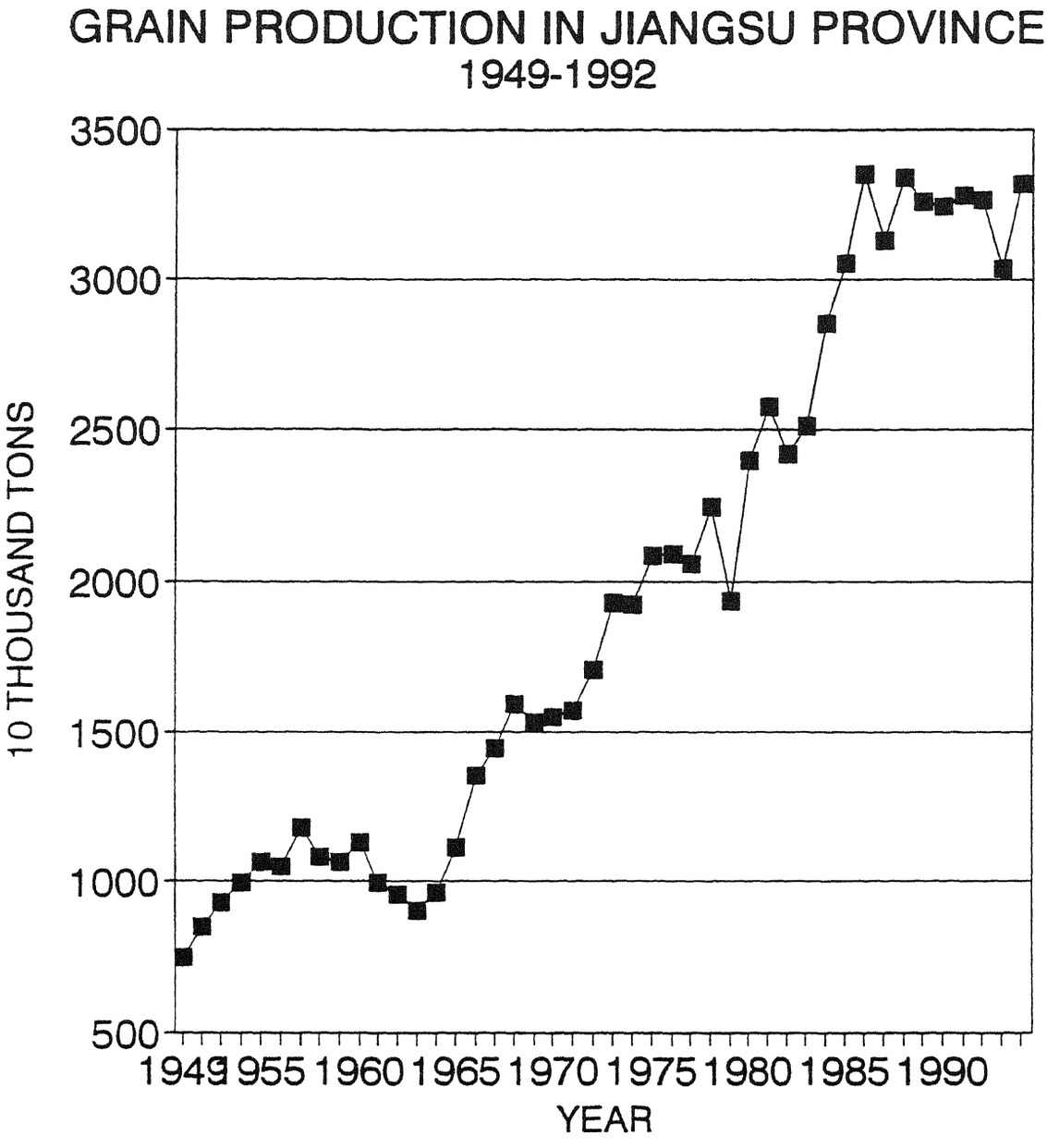
[a]Measured in 100 million yuan in current prices.
[b]Measured in 10 thousand mus.
[c]Measured in mu per person.

TABLE : EXPORTS OF MAJOR AGRICULTURAL AND FISHERY PRODUCTS (TONS) IN JIANGSU PROVINCE.

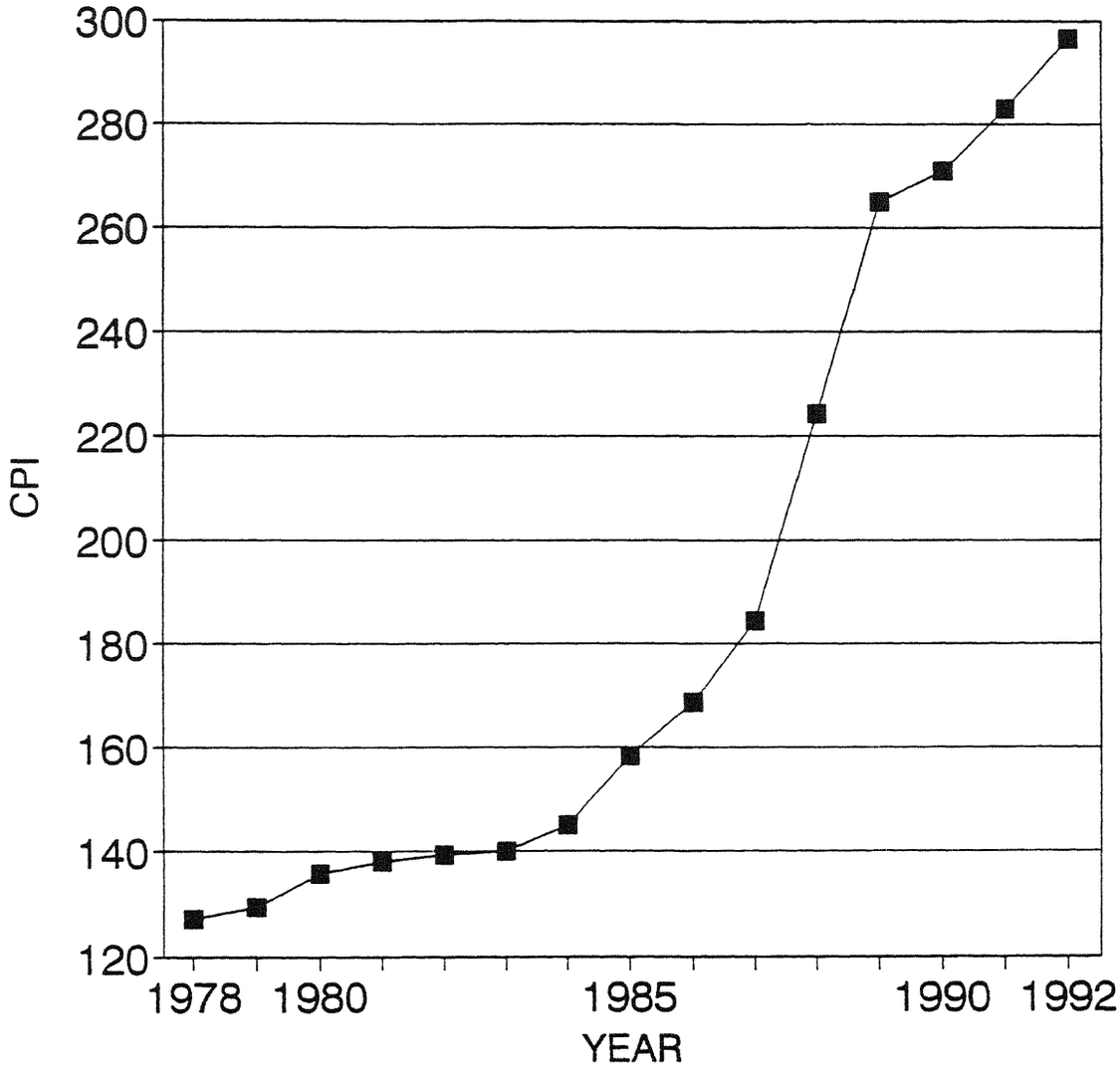
YEAR	FROZEN PORK	PROCESSED PORK	FROZEN POULTRY	FRESH EGGS
1978	6,869	132	5,716	3,100
1981	16,363	2,884	5,312	4,810
1985	25,305	10,702	817	3,365
1988	6,707	13,463	807	3,154
1989	14,665	13,563	1,156	3,298
1990	26,347	13,539	1,794	360
1991	17,882	14,362	1,174	429
1992	1,480	8,221	2,096	354

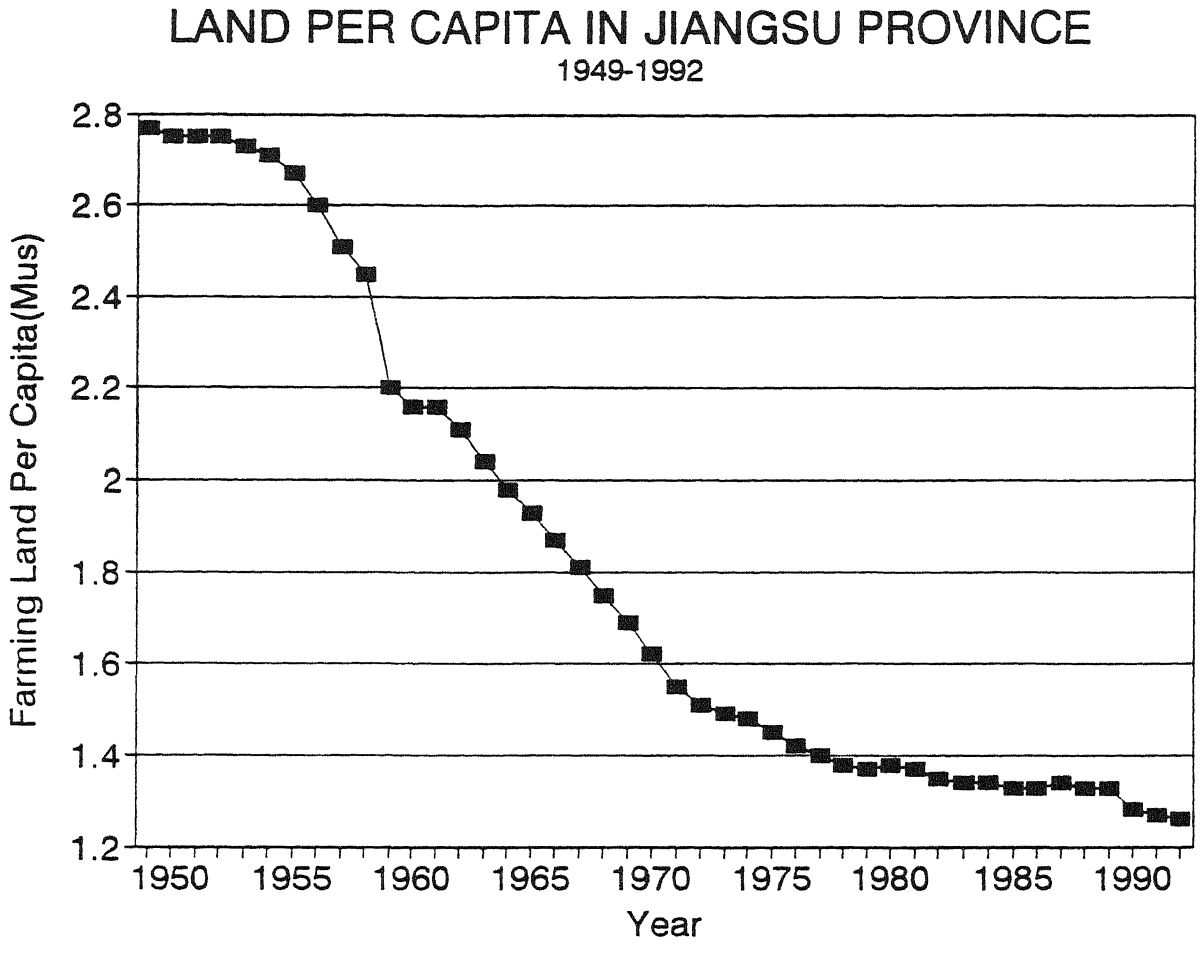
YEAR	FISHERY PRODUCTS	VEGETABLE	COTTON	SILK	TEA
1978	964	835	11,021	862	363
1981	6,387	6,237	6,967	1,000	1,559
1985	10,465	22,706	97,734	1,661	1,427
1988	15,339	30,406	36,583	1,526	682
1989	14,400	28,252	10,814	1,392	1,129
1990	13,853	29,551	4,652	1,189	1,429
1991	12,730	39,247	10,037	1,163	1,649
1992	13,694	41,648	NA	1,425	1,233


OUTPUTS OF OTHER CROPS IN JIANGSU
1949-1992
10 THOUSAND TONS
100
90
80
70
60
50
40
30
20
10
0
1949 1955 1960 1965 1970 1975 1980 1985 1990
YEAR
COTTON
PEANUT
RAPESEED

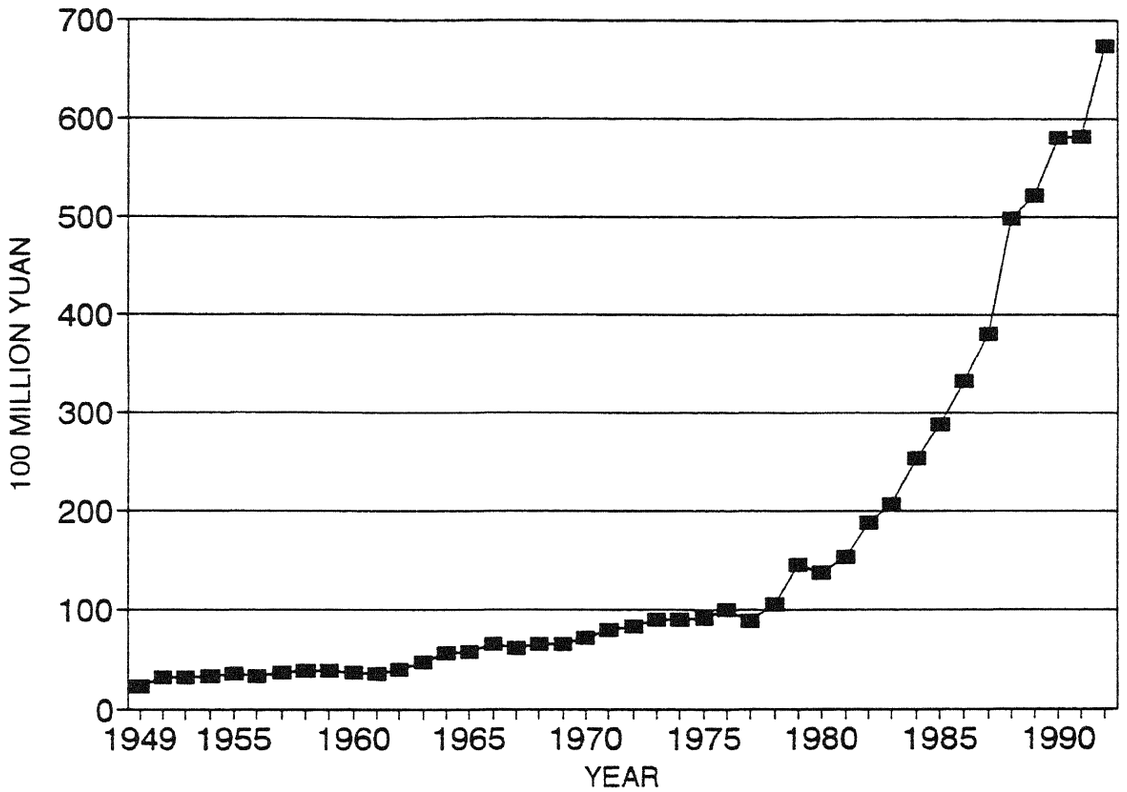

GRAIN PRODUCTION IN JIANGSU PROVINCE
1949-1992
10 THOUSAND TONS
3500
3000
2500
2000
1500
1000
500
1949
1955
1960
1965
1970
1975
1980
1985
1990
YEAR

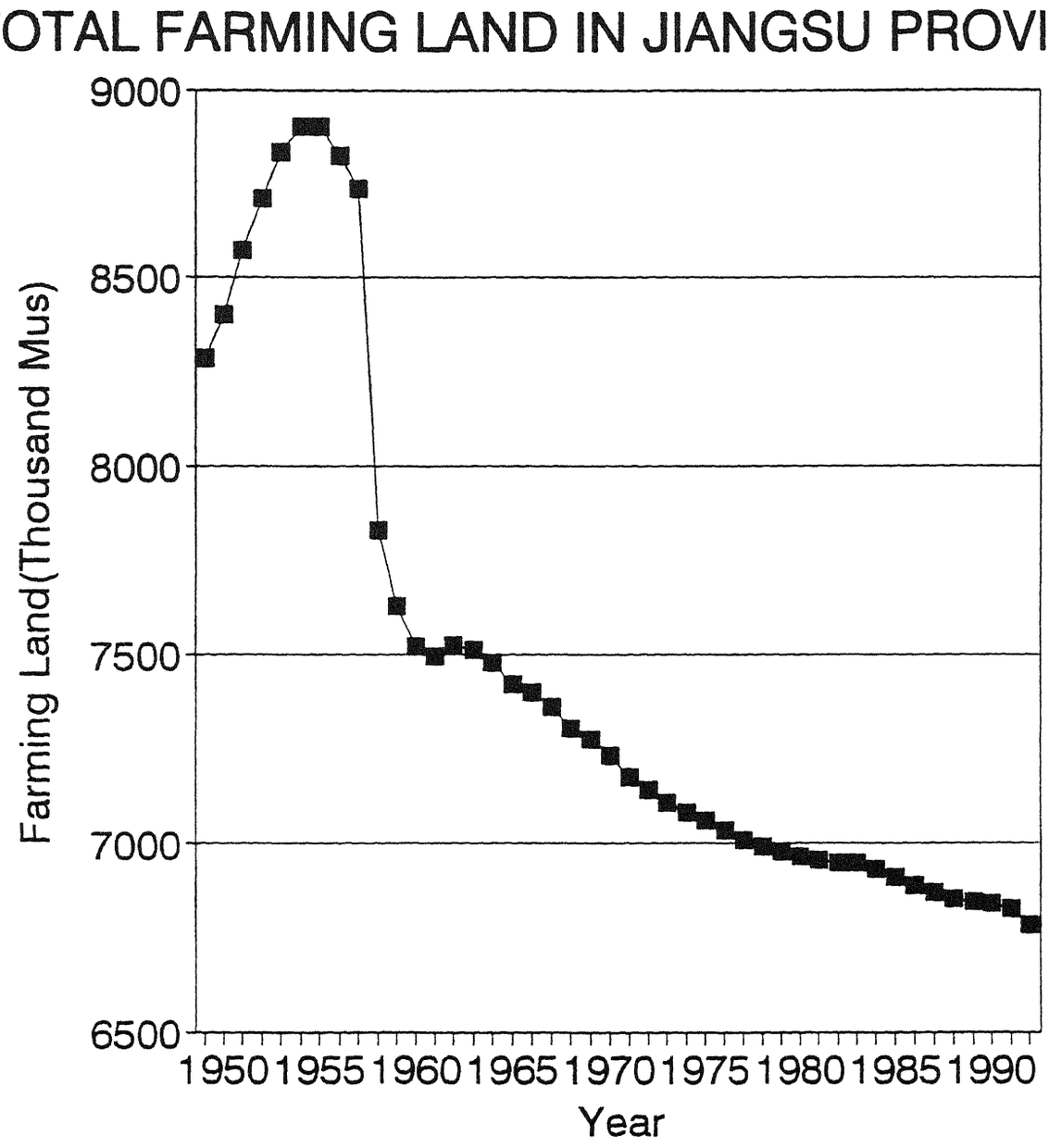
TOTAL RETAIL PRICE INDEX IN JIANGSU
1978-1992(BASE YEAR 1950)




LAND PER CAPITA IN JIANGSU PROVINCE
1949-1992
Farming Land Per Capita(Mus)
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1950
1955
1960
1965
1970
1975
1980
1985
1990
Year

TOTAL AGRICULTURAL PRODUCTS IN JIANGSU
1949-1992




TOTAL FARMING LAND IN JIANGSU PROVINCE
Farming Land(Thousand Mus)
9000
8500
8000
7500
7000
6500
1950 1955 1960 1965 1970 1975 1980 1985 1990
Year